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Automotive Division

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JULIAN CHASE, Vice-Pres. G. C. BUZY, Vice-Pres.

OFFICES

Philadelphia 39, Pa.—Chestnut & 56th Sts., Phone Sherwood 1424
New York 17, N. Y.—100 E. 42nd St., Phone Murray Hill 5-5600
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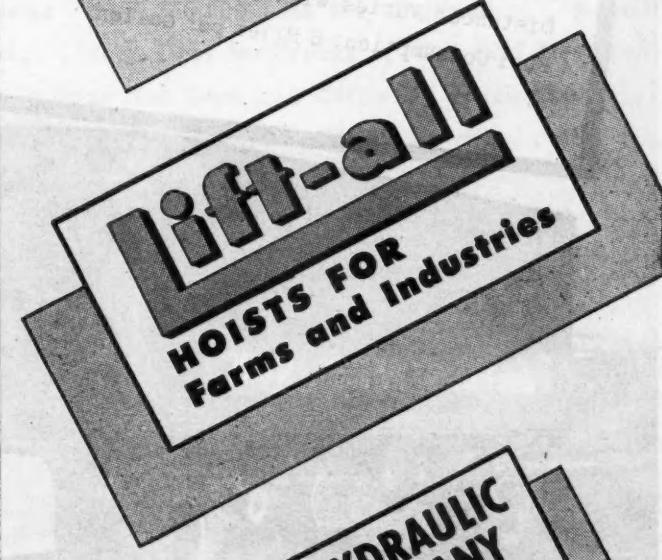
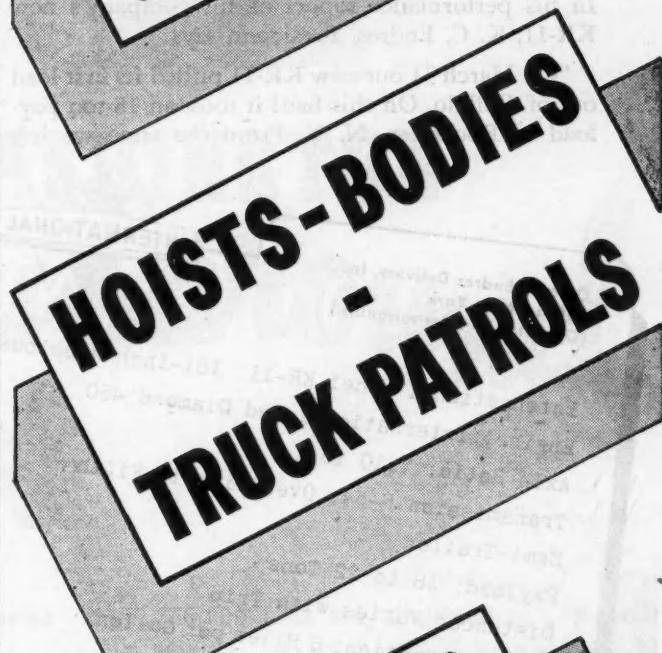
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"BEST TRUCK FOR THIS JOB"

—Endres Delivery, Inc.

A Performance Report of an INTERNATIONAL KR-11

THE INTERNATIONAL KR-11 below, powered by the famous Red Diamond 450 Engine, was recommended to Endres Delivery, Inc., Buffalo, N. Y., in precise terms of the job it was to perform and the conditions under which it was to operate... the basis on which Internationals always are sold.

Endres Delivery, Inc., operates 35 Internationals. In his performance report of his company's new KR-11, K. C. Endres, President, says:

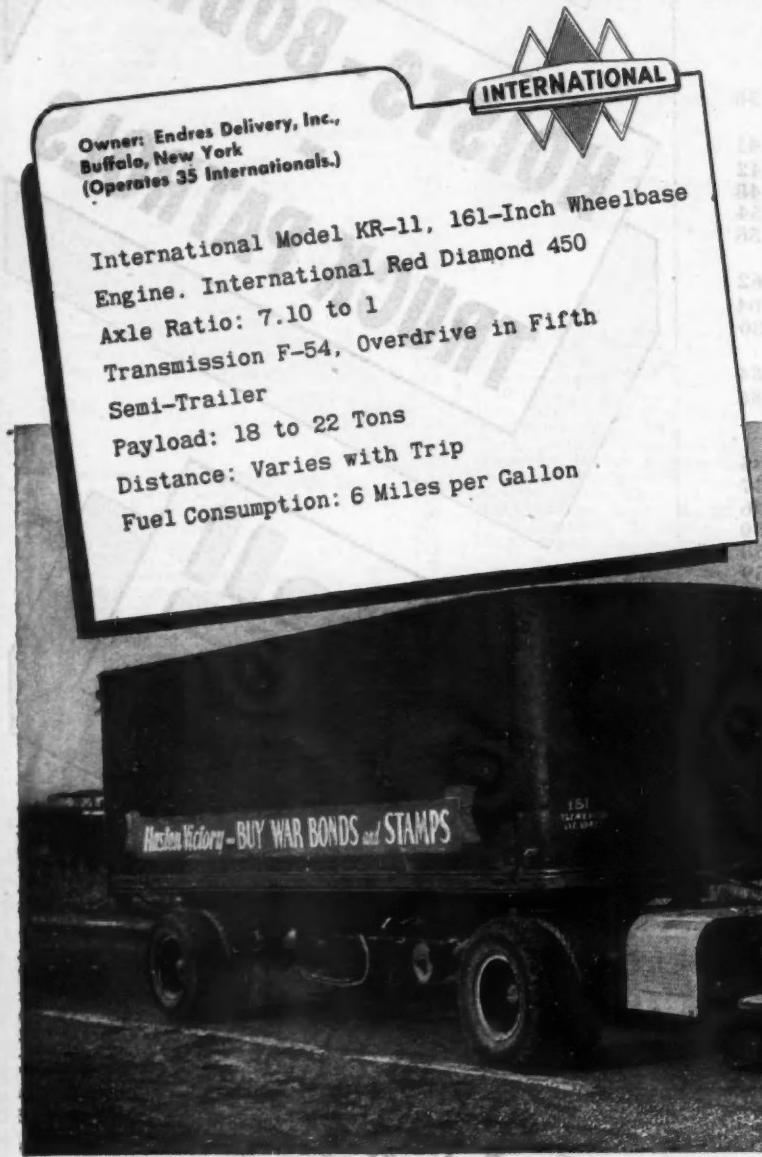
"On March 31 our new KR-11 pulled its first load out of Buffalo. On this haul it took an 18-ton payload to Rochester, N. Y. From the time we left

Transit Road and except through Batavia, we operated it overdrive all the way.

"In our 24 years of over-the-road operation we have had a lot of experience, and it is our belief that this is the best truck for this job we ever had. During the month of April it covered 5,229 miles and averaged 6 miles to the gallon of gasoline."

Every day International KR and KS-11's demonstrate the cost-savings and profit-increases that result when trucks are big enough and strong enough for loads and roads... with axle ratios and transmissions correctly specified to produce required performance and desired cruising speed at safe engine speeds.

Today, as before the War, when more International Heavy-Duty Trucks were sold than any other make, Internationals are built, sold and serviced to provide utmost job performance, efficiency and economy.



Owner: Endres Delivery, Inc.,
Buffalo, New York
(Operates 35 Internationals.)

International Model KR-11, 161-Inch Wheelbase
Engine. International Red Diamond 450
Axle Ratio: 7.10 to 1
Transmission F-54, Overdrive in Fifth
Semi-Trailer
Payload: 18 to 22 Tons
Distance: Varies with Trip
Fuel Consumption: 6 Miles per Gallon

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue, Chicago 1, Illinois



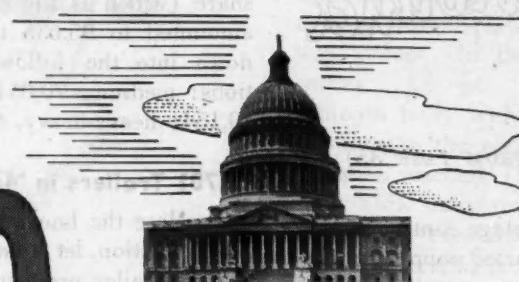
New Trucks: The government has authorized the manufacture of a limited quantity of trucks for essential civilian hauling. International is building them in medium-duty and heavy-duty sizes. See your International Dealer or Branch now, and get valuable help in making out your application.



INTERNATIONAL Trucks

COMMERCIAL CAR JOURNAL

Vol. LXVIII, No. 6, February, 1945



WASHINGON *Runaround*

Assault on Batteries

If it's not one thing it's another. In fact, it's about time fleet operators came to expect one thing after another. This time it's a shortage of lead. Not lead for pencils; lead for storage batteries. The lead shortage is so serious that over the loud squawks of ODT, the War Production Board has slashed battery production for civilians in the first quarter. It's a 25 per cent slash. What happens in the second quarter will depend upon the success of efforts being made to increase lead production. Insiders expect a 25 per cent cut in the second quarter as well.

4,750,000 Less for Civilians

What does this mean to civilian truck and passenger car users? It means that whereas they needed and got 19,250,000 batteries to get along in 1944, they will have to make out somehow with about 14,500,000 storage batteries. Civilians must take a rap for around 4,750,000 batteries. Who will the rapees be?

Rationing Being Studied

The answer to that last question is giving federal agencies some concern. It gave battery manufacturers some concern, too; so much that their association went on record with WPB as favoring battery rationing. This viewpoint, let us hasten to add, did not have the approval of all battery manufacturers. Nor did it reflect the thinking of Federal agencies, some of whom are opposed to rationing. But WPB delegated the matter to a committee for study, with instructions to report Feb. 9. ODT did not appear to be in favor of rationing batteries. But to protect essential truck users, there appeared a likelihood that ODT would recommend the use of MT 109's. This would give essential truck users a priority.

More Tires for Trucks

The tire picture, on the other hand, was showing some improvement. The tire industry was reported to be increasing truck tire production far above what had been anticipated. In authoritative Government circles

Assault on Batteries . . . 4,750,000 Less for Civilians . . . Rationing Being Studied . . . More Tires for Trucks . . . But ODT Not Optimistic . . . Parts Outlook Not Dark . . . ODT's '44 Truck Share . . . 22,701 Trailers in '44 . . . Applications Clamp Down . . . Etc. etc.

by GEORGE T. HOOK

it was felt that quotas of civilian truck tires would be definitely increased in the second quarter. There was even a possibility that in February and March civilian operators would get a bonus on top of the established quota of 110,000 tires in sizes 8.25 and up.

But ODT Not Optimistic

An industry spokesman, testifying before a Senate committee, predicted that "we'll be flooded with tires this

spring." But in ODT the viewpoint on tires remained pessimistic. Military demands were heavy and ODT apparently felt that it could not afford to be optimistic. Although vehicles reported out of service for lack of tires remained at around the 5000 mark, and although it was not being bombarded with operators' complaints, ODT was engaged in laying plans for an "emergency period" during the summer months just in case

(TURN TO NEXT PAGE, PLEASE)



(CONTINUED FROM PAGE 35)

the truck tire shortage continued and tires in service started popping under the effects of warm weather. ODT had approached organized operator groups, asking them to suggest ways and means for coping with any emergency that might arise in the near future. It was a friendly gesture. It was also astute. The chances were good that industry itself would suggest, as a primary consideration before the issuance of any more orders, that the existing orders be enforced. If so, this would provide ODT with the moral and public support necessary to any full-scale attempt to enforce conservation orders to the letter.

Parts Outlook Not Dark

The replacement parts outlook for 1945 is not dark. Because of the so-called manpower shortage 1944 production may not be equalled but the anticipated differential is not occasioning any alarm in Government circles. Based on actual automotive parts production figures for 10 months and an informed estimate for the other two months, 1944 production was valued at around \$763,000,000. This compares with \$508,993,615 worth of parts production in 1943. Greater than any likelihood of a parts shortage is ODT's fear that regulated operators may get along so well as to neglect filling out monthly I.C.C. Bureau of Motor Carrier reports dealing with delays due to lack of replacement parts. ODT relies heavily on these reports and urges operators to make them out whether delays are negligible or even nonexistent. They are necessary to a complete and persuasive statistical argument in the event delays should become frequent.

ODT's '44 Truck Share

Truck production for civilians in 1944 came closer to the programmed figure of 101,298 than anyone thought it would. Back in late October informed guessers were settling for between 81,000 and 86,000 trucks, and this department was guessing 91,000. Actually ODT's share (which is the civilian share) amounted to 95,635 trucks, broken down into the following classifications: medium, 70,054; light-heavy, 19,154; heavy-heavy, 6427.

22,701 Trailers in '44

To close the books on 1944 vehicle production, let it be recorded that civilian trailer production amounted to 22,701 units of all types. The programmed figure was 26,011. Civilian operators got all of the 22,701 trailers with the exception of a few pole trailers which went to the Foreign Economic Administration.

Applications Clamp Down

Early in January the ODT Allocation Section clamped down temporarily on all applications for International Harvester trucks. This action became necessary due to circumstances over which neither ODT nor IHC had any control. The ODT Allocation Section tries to keep its approvals 60 days ahead of production schedules. It was adhering to this routine when previously approved schedules for the first half of 1945 were suddenly slashed by WPB due to military demands. IHC's share of the slash was such that on the basis of actual production ODT allocations were not 60 days but 5 months ahead of production. Certificates of transfer are good only for 90 days, unless extended, and such extensions will be granted those who applied for Internationals. When International's production catches up with allocations, ODT will resume receiving applications for Internationals. About the middle of January it was indicated to this department that other makes of trucks might be similarly affected.

259,052 Vehicles Rationed

When the ODT Allocation Section closed its books on Dec. 31, 1944, the statistics showed that from March 9, 1942, it had rationed out to civilians 219,394 trucks and 39,658 trailers. The truck breakdown was:

light, 29,224; medium, 145,061; heavy, 45,109.

If anyone is interested in vehicle allocations for the year 1944 alone, here they are: Trucks, 118,664 (light, 6723; medium, 82,133; heavy, 29,808); trailers, 22,983.

Repair Services "Critical"

The War Manpower Commission, in declaring all automotive repair services to be critical activities, put all fleet repair shops in the category of activities which will get a break on deferments from Selective Service. Over-the-road trucking also was labelled critical, along with production of trucks, trailers, parts, accessories and tires. At the moment of writing, the War Manpower Commission had not defined over-the-road trucking, but it was hoped in ODT's able, well-functioning, highly-regarded manpower section that the following definition would be adopted: "Over-the-road trucking shall include (1) all cargoes transported by common carriers; (2) essential or unclassified products transported by contract carriers, and (3) essential products transported by private carriers."

Critical Essential Benefits

What are the benefits that go with the designations "critical" and "essential"? Well, critical activities are entitled to apply for deferment of employees 26 years of age and up; essential activities to deferment of employees 30 years of age and up. Local boards have been instructed not to give deferments to less than essential industries. This means that local trucking and private truck operators will have to apply for and get a "locally needed" designation in order to get deferments.

And in Conclusion . . .

Because many ODT regions claim that many joint-action plans are in effect which are not a matter of record, ODT headquarters has asked all regions to furnish a list of all joint-action plans. . . . It was regarded as a possibility—very remote, in this department's opinion—that, because of the manpower shortage, light trucks in the 1945 truck production program would not be produced. Some quarters thought they fell in

(TURN TO PAGE 197, PLEASE)

Editorials

The Public Supports Fleets on Car Design

If a recent poll of newspaper readers, sponsored by the Body Activity Committee of the Society of Automotive Engineers, means anything it certainly means that a majority of automobile users prefer a motor car that embodies a maximum of safety and comfort and a minimum of ornamentation and gadgetry.

This is precisely what fleet operators have been advocating for the last 15 years.

Before the Great Depression, back in the Boom Days, the economical fleet car was a subject for periodic discussion at meetings of fleet operators. Periodically fleet operators would get up on a rostrum and wonder why it was not possible for them to buy an automobile devoid of the ginger-bread and the extras offered the general public. Their primary interest was in a unit of transportation which could be operated for the lowest cost per mile. They knew that the original cost and maintenance of chrome plate, fancy moldings, ornamental hardware and gadgets represented an operating expense which brought them no commensurate return. All they wanted was an automobile that was safe, comfortable and mechanically reliable. Even back in those days they wanted accessibility, but that's another story.

Just as periodically their pleas were answered by car factory representatives who mounted the same rostrum and who, collectively, argued somewhat after this fashion:

"We sympathize with the point of view of fleet operators. (This was just to show there were no hard feel-

ings.) But whether they know it or not they are riding on the coat-tails of the general public. Automobile manufacturing is a mass production business. Millions of cars are built each year. These cars are designed to meet the demands of the general public. Because of this mass production process, a car with all of the unwanted gadgets and ornamentation costs the fleet operator less than would a stripped car built in smaller quantities on a separate assembly line. Besides, the fleet operator should consider his trade-in allowance. The stripped fleet car would be devoid of popular appeal and, therefore, the dealer could not allow as much on it as on a standard production job."

For years that was the stock answer given to fleet operators. Then came the Great Depression and with keener competition the car manufacturers changed their tactics and tried to give fleet operators what they wanted. The popular makes developed "fleet models" with economy features, such as throttle stops, smaller carburetors, smaller jets, special axle ratios, etc. This publication referred to them affectionately as "miser models." They were a step in the right direction. But fleet operators still had to take a lot of stuff that they would rather have done without.

NOW comes this survey of public preferences, conducted by newspapers in New York, Chicago, San Francisco and New Orleans at the suggestion of the S.A.E. Body Activity. And fleet operators, quite naturally, are wondering if it will influ-

ence manufacturers to take another step in the direction of the economical car which they have all along advocated. Certainly, to judge by some of the answers to pertinent questions, the manufacturers have not been building the kind of car desired by a majority of the general public and by fleet operators. The reaction against chrome-plating, for instance, was violent. In the San Francisco survey 75.3 per cent favored a "smooth body with plain surfaces." In Chicago the preference for plain surfaces reached 71 per cent. The New York study reached the conclusion that "extensive use of chrome is a peeve among the majority of motorists." The New Orleans study, conducted on a lesser scale than the others, indicated that in the matter of chrome plating this part of the South was at war with the other States. The study concluded that "generous use of chrome plating, striping, the use of colored plastics on the dash and molding, is suggested."

With regard to the elimination of special equipment, only the Chicago and San Francisco studies developed definite statistics. In San Francisco 62.5 per cent said they would prefer to have their "next car built without special equipment." In Chicago there was a 55 per cent preference for no special equipment.

In Chicago and San Francisco 73 and 74 per cent, respectively, came out for improved vision. New Orleans favored better vision and in the New York study most of the respondents "stressed the belief that vision was insufficient to meet the requirements of safety."

New York, Chicago and San Francisco came out overwhelmingly against any more sacrifice of headroom to provide lower, more rakish roofs. New Orleans was in rebellion on this point, the study claiming that "the public want streamlined appearance, even at the sacrifice of other features, such as comfort and convenience."

AND to all this representatives of the American Automobile Association, which has been the recipient of "floods of complaints" from its more than a million car-owning members, added a few words about accessibility which supports the opinion of (TURN TO PAGE 240, PLEASE)

RETUNING FOR 70 OCTANE

The most critical item affecting the octane requirements of an engine is spark timing. It should be adjusted as close to the detonating point as possible for careful operation. Retarding one degree will compensate for $1\frac{1}{2}$ octane numbers. Most engines will accommodate five degrees of retardation without damage.

When retuning to 70 octane fuel, the

fuel pump pressure should be about 3 lb. per sq. in. at the carburetor. Checks should be made of the float level, power jet, and intake manifold to insure the rich air-fuel mixture required.

Water jacket temperature should be kept around 160 degrees and spark plugs with the proper heat range used, since high operating temperature will aggravate detonation and cause loss of power.

The rest depends upon proper driving.

Adjusting Engines to Lower Octane Gas

In tuning for 70 octane gas, ODT suggests retarded spark, 3 in. fuel pump pressure, a rich air-fuel mixture and water jacket temperature 150-170 deg.

THE military requirements for 100 octane gasoline have been increasing during the current year and, as a result, the amount of tetraethyl of lead for use in civilian grade gasoline has been increasingly limited. This shortage of tetraethyl of lead has been reflected in reduced anti-knock value of civilian motor fuels. Under Petroleum Administration For War the production of premium grade gasoline was reduced to about the amount produced in 1941. Shortly thereafter, the ceiling of octane rating for regular or "house" brand gasoline was reduced to 70 octane ASTM motor method.

Currently the production of premium grade gasoline has again been reduced 50 per cent. The new ceiling of regular grade has been reduced to 70 octane. Any available third grade gasoline on the market is not affected by these orders.

As a result of these necessary restrictions, some truck and bus operators, who have been purchasing premium grade gasoline, have been denied deliveries of premium gasoline equal to their previous purchases. Some users of regular or "house" brand gasoline have also experienced difficulty since the reduction of regular grade gasoline to 70 octane.

The prospects are that these conditions will prevail until the cessation of European hostilities, so that operators must retune and readjust their engines to the use of 70 octane fuel whenever this is possible. Only the owners of high compression engines who are engaged in heavy-

duty service can hope to obtain premium (76 octane) gasoline.

Many variables contribute to an engine's requirements for premium grade gasoline. The size of the cylinder bore, the extent to which maximum horsepower is needed continuously, conditions in the interior of the engine and adjustments of engine accessories, all affect the apparent requirement of an engine for a certain octane quality gasoline.

The handling of the vehicle by the driver can also have an effect equal to several octane numbers. Hence, one of the tasks in the use of the current wartime gasolines is to acquaint the driver with the reduced qualities of the gasoline used, in order that he may change his driving habits so as to obtain optimum operation with the wartime fuels and still do no damage to the mechanical parts of his engine.

Factors Affecting Octane Requirements

The octane requirement of any specific engine in truck or bus service depends upon a number of things, some of which are under the direct control of the maintenance man and others are a matter of design and operation.

The most important item over which the maintenance mechanic has control and which he can adjust or repair to obtain best use of 70 octane gasoline are spark timing, errors in the action of spark timing mechanism and fuel-pump delivery pressure.

Other maintenance and repair items which affect the performance of an engine and which may cause knocking when 70 octane gasoline is used are carburetor adjustment and float level, air leaks into intake manifold, spark plugs, carbon deposits in the combustion chamber, manifold temperature control, engine water temperature and rust, corrosion and hard water scale.

Methods of use and operation of a vehicle have a very definite effect upon an engine's octane requirements. These items over which the maintenance mechanic has no control are overloading of vehicle and driver's operating habits such as rapid acceleration in starting vehicle, "lugging" engine instead of shifting down in transmission gears and speeding.

Other items over which the maintenance mechanic does not have control and which affect an engine's octane requirements are combustion chamber design, compression ratio and manifolding and mixture distribution.

Spark Timing Is Critical

The maintenance mechanic can make certain specific readjustments and corrections in the items which he directly controls, so that engines may be adapted to the use of wartime gasoline.

Spark timing is the most critical item affecting the use of 70 octane fuel. It has been found in many cases that 1 deg. retardation of the spark timing will compensate for approximately 1½ octane numbers in gasoline rating. Most engines will accommodate at least 5 deg. of spark retardation without seriously affecting performance. This amount of retardation of the spark will compensate for an octane reduction of between 7 and 8 octane numbers.

With retarded spark, an engine may give off more heat, which may be reflected in higher water temperature. This greater heat rejection represents a loss of economy and is not a functional ailment. Hence, improved cooling can overcome the heating effects of retarded spark and will permit continuous operation with less torque output.

In setting spark timing for lower octane gasoline in the conventional manner, some retardation of the spark below the manufacturer's original standards may be necessary. The amount will vary with types and models of engines and the severity of service, so that the limits will have to be determined by the individual operator.

One operator reports that instead of retarding the en-

DRIVER'S OPERATION AFFECTS OCTANE REQUIREMENTS

The driver can definitely affect an engine's octane requirements by his misuse of the engine. He should be made to understand that careless driving habits will cancel out adjustments made to eliminate detonation and result in decreased power, overheating and increased fuel consumption. Since the engine has been adjusted as close to the detonating point as possible, manipulation of the throttle and transmission requires skill and care.

Five rules that should be followed by the driver are:

1. Don't floor the accelerator when starting the vehicle (jackrabbit starts).
2. Don't "lug" the engine. Shift down before detonation occurs. (Early shifting down for hills with increased engine speed will not harm the engine, but climbing them in high gear with resulting detonation will cause damage).
3. Start in low gear and shift up through each gear in turn.
4. Don't exceed the speed limit.
5. Report promptly any excessive detonation.

tire distributor and thus changing the spark timing at idle speeds, he has found it expedient to alter the mechanical advance mechanism in the distributor so that the automotive advance is reduced from 24 deg. to 13 deg. Whenever this method is used, the operator should determine his individual standards in a "cut and try" basis.

Accuracy in the setting of spark timing is most essential. One automotive service engineer reports that as much as 2 or 3 deg. variation in timing may result, depending on whether adjustment is made by tall or short mechanics, when using flywheel markings. These errors were due to the width of the opening in the flywheel housing which permits the mechanic considerable sidewise leeway in lining up his eye with the fixed timing mark. To overcome this error, the engineer suggests covering the opening with a metal plate which has only a $\frac{1}{4}$ in. wide slot at the timing mark. The narrow slot compels the mechanic to center

his line of vision and makes his adjustments more exact.

Accurate spark timing with a timing light is dependent upon the accuracy of the breaker points opening. Before starting any spark timing procedure, the breaker points should be inspected and adjusted to recommended standards.

Furthermore, before starting any spark timing procedure, all other engine adjustments and conditions which affect engine operation should be corrected as much as possible. Many of these items, such as valve tappet "lash," battery condition and regulating voltage, and compression of individual cylinders are involved. These items must be considered by the mechanic in his adjustment work.

In developing the optimum spark timing for a specific operation, it will be best for the operator to test a number of similar trucks under actual full load conditions. Two road tests which apparently are quite satisfactory have been brought to our attention. In both tests, the spark should first be retarded to an extent estimated as necessary in accordance with a consideration of the relation between original flywheel markings, engine compression ratio and decrease in octane rating of gasoline used.

After the determination of a suitable standard setting and for reliability in later routine rechecking of spark timing, it may be desirable to recalibrate and mark the flywheels for the new spark setting in order that timing

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Adjusting Engines to Lower Octane Gas

(CONTINUED FROM PAGE 39)

lights can be easily and accurately used.

Errors In Spark Timing

As a result of wear, most automatic spark advance mechanisms tend to advance the spark faster than the original rate. This tendency may cause error in timing at higher speeds when the distributor is set at idle speeds. For this reason, if timing is set by road testing or at high engine speeds, one may sometimes obtain unsatisfactory idle speed spark timing if the automatic advance is seriously in error. Such an idle condition is not of serious consequence if the spark timing is correct at customary engine speeds. This fact may have to be pointed out to both mechanics and drivers as both may have become accustomed to expecting very smooth idle operation.

Wear in the distributor shaft bushings may permit the breaker cam to wander so that timing may vary in different cylinders. This wandering of the cam causes detonation in certain cylinders and may give a mis-

MANIFOLD TEMPERATURE CONTROL REDUCES DILUTION

The reduced volatility of wartime gasoline may increase crankcase dilution on cool operating engines. Therefore, the manifold heat control valve should be maintained in free operating condition, and the heat exchange areas should be kept free of deposits. Guarding the front end of the intake manifold against cold blasts of air may also help dilution problems. Excessive manifold heat may aggravate detonation and cause a loss of power.

ROAD TEST FOR CORRECT SPARK SETTING

The vehicle should be fully loaded and a level stretch of road selected to make the test run. With the engine at regular operating temperature, start the vehicle and shift into high gear at a speed of approximately 15 m.p.h. Open the throttle fully and note the speed at which detonation disappears. With a desirable spark setting, the just noticeable knock should completely disappear below 25 m.p.h. If the knock disappears before 25 m.p.h., the spark can be advanced; if it continues after 25 m.p.h., the spark should be further retarded. A short run should then be made to determine whether acceleration, power and performance are satisfactory.

leading impression regarding engine operation. Insofar as possible, the distributor camshaft bushings should be maintained in or repaired to a steady operating condition. The cam dwell meter is an instrument which can be used to indicate the uniformity with which the spark is being timed by the distributor. Wander of the cam is indicated by variations in the cam dwell meter readings.

Vacuum Advance Mechanism

Many engines are equipped with auxiliary vacuum advance mechanisms on the distributor to give additional spark advance under high speed, partial throttle operation. These vacuum advance mechanisms are subject to defects which produce irregular spark timing.

It is sometimes found that vacuum mechanisms will advance for short periods during the starting accelerations of a heavy vehicle during the time the throttle is in a partial throttle position, and this incorrect advance may cause brief periods of detonation. To reduce this incorrect advance, the capacity of the line leading from the carburetor to the vacuum unit may be increased. The additional air in the larger line will slow up the speed of the vacuum advance mechanism but will not change the complete action of the advance mechanism under true, partial-throttle operation. In general, the line from the vacuum chamber to the carburetor can be increased in size from $\frac{1}{8}$ in. or $\frac{3}{16}$ in. in diameter to a $\frac{5}{16}$ in. diameter, and the line can be lengthened.

Conversely, as a result of obstructions in the vacuum line or the orifice leading into the carburetor throat, the response of the vacuum advance may be too slow when the throttle is suddenly opened from a partial throt-

tle position. To correct this slow action, the vacuum line and its carburetor orifice should be cleaned and checked to make sure opening is free.

Another method of retarding the action of the vacuum advance mechanism is to increase the rate or pressure of the retard spring of the vacuum advance mechanism. The amount of increase in spring pressure can be determined by "cut and try" methods. The object in making this change is to delay the time at which the vacuum advance operates, but not to prevent the advance action under light loads when high manifold vacuums exist.

Where engine speed governors are used, they may be a cause of incorrect action of the vacuum advance mechanism. Governors which are furnished for use with vacuum advance distributors are equipped with a transfer valve in the body of the governor. This valve transfers the open connection of the vacuum line into the carburetor from the orifice at the throttle to an orifice at the governor butterfly, depending upon the relative position of the throttle and the governor butterfly.

If this transfer valve sticks in one or the other of its two positions, the action of the vacuum advance may be irregular. When the transfer valve is stuck, the vacuum advance may not advance under certain partial throttle conditions so that the economies and improved performance of greater

(TURN TO PAGE 100, PLEASE)

AVOID THE FATAL FIVE

The critical shortage of lead and the current increased military demands has restricted the production of truck batteries, according to WPB. In outlining conservation steps, ODT emphasizes the need for better care and maintenance and suggests measures for prolonging battery life.

Five principal factors affecting the life of the battery are: Lack of water, loose hold down straps, overcharging, undercharging and the use of "dopes" in the electrolyte.

ODT asks that the fleet operator check his batteries regularly and recharge them when necessary to avoid deterioration and freezing.

The Navy has the answer to the battery problem in the Weekly Battery Inspection Report, a comprehensive check sheet used in systematic servicing of its batteries.



THE Office of Defense Transportation, in a recent bulletin to the district maintenance advisory committees, emphasized the need for prolonging the life of storage batteries by proper and regular maintenance. The warning is particularly timely, since the War Production Board, due to critical shortages of lead and increased military demands, has amended its Order L-180 restricting the production of replacement storage batteries for both trucks and passenger cars during the first quarter of 1945 to the same amount that was manufactured in the fourth quarter of 1944.

ODT points out that a storage battery has peculiar characteristics and should be considered as a wearing part, since its useful life is limited. As one of the most important accessories of the engine, a battery must be used and charged to be kept in operating condition, and if left standing without charging, it will deteriorate until it becomes useless.

Battery dealers have to check and charge their new batteries at frequent intervals to keep them in a usable condition. This necessary charging of new batteries means that the individual truck owner cannot store a new battery for six months or so

Battery Shortage Suggests Life-Preserving Routine

ODT lists five common reasons why batteries wear out prematurely and gives corrective suggestions. Navy's program effective

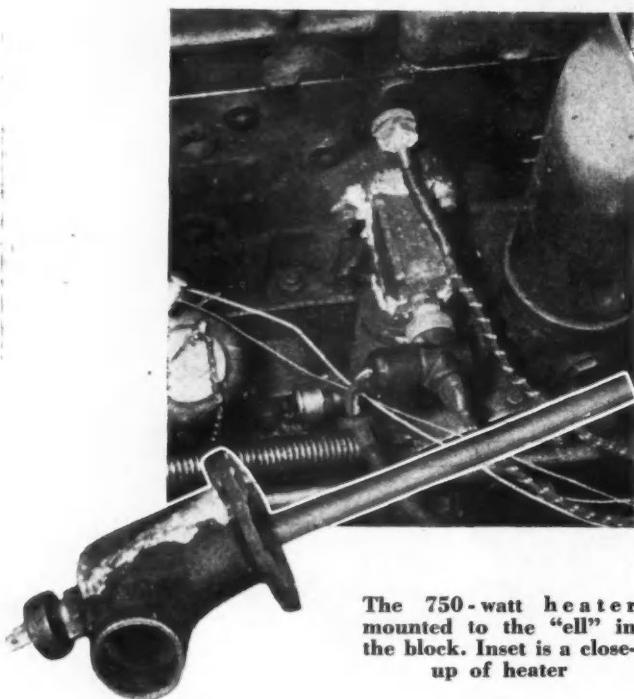
and still have a useful battery. Six months' storage of a wet battery without proper and frequent charging will only result in a hard rubber box full of lead and chemicals which are useless insofar as the storage of electricity is concerned.

The ODT asks that the fleet operator check his batteries frequently to determine the degree of charge, for whenever the specific gravity is below 1225, a recharge is in order.

Conservation Necessary

Due to the present shortages of materials and manpower, conservation practices must be observed by driver and mechanic alike in order to keep the battery operating efficiently to the fullest extent of its life. The driver possibly has not considered his part in prolonging battery life. He must remember to turn off all unnecessary lights when the truck is

(TURN TO PAGE 176, PLEASE)



The 750-watt heater mounted to the "ell" in the block. Inset is a close-up of heater

Cold Starting with Immersion Heaters

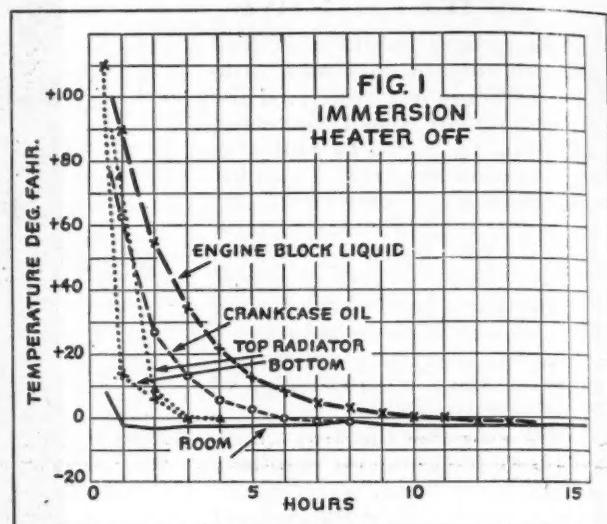


Emil P. Gohn

THE purpose of this report is to present data on starting truck equipment easily and quickly in the morning during winter operation, using a method that is not original with us but which, to the best of our knowledge, has not been fully explored for practical utilization.

Towards this end, it was decided to experiment with electric immersion heaters, which were installed in the cylinder block to heat the liquid surrounding the cylinder walls.

Most of our truck equipment covering Philadelphia is stored outside, where it is subject to ambient temperatures and winds. Considering our Philadelphia fleet at the moment, we find from weather reports the following:



AT LAST . . . SOME FACTS

The tests described and discussed in this article provide fleet operators with practical information to which they have never previously had access. The tests conclusively proved the usefulness of immersion heaters in effecting quick starts in outside temperatures of around Zero. Several tests were made at 17 deg. below Zero with a 1250-watt heater and showed that

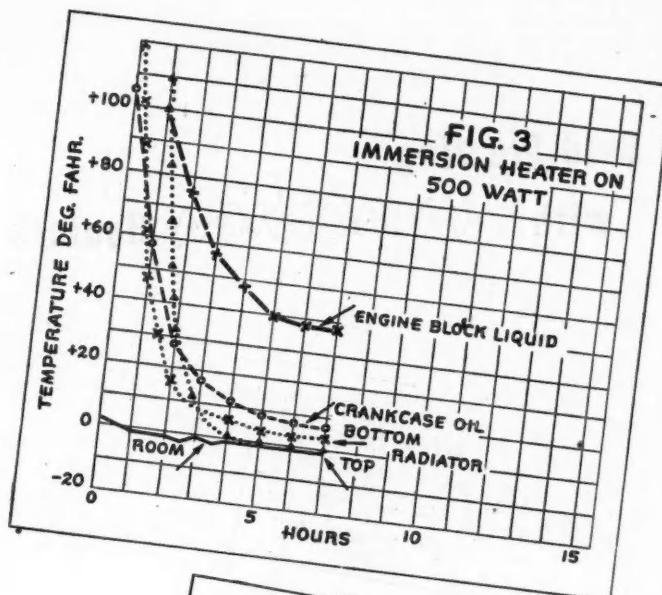
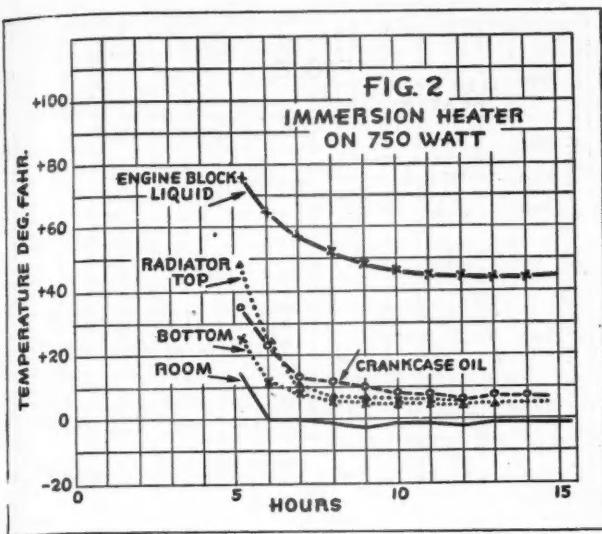
Tests prove that with temperature at heating block liquid to 44 deg., and

Number of Days of 32° F. and below

Average of Lowest Temp.

Month	1943	70 Years for 1943	Average of Lowest Temp.
January	26 Days	22 Days	15° F.
February	19 Days	20 Days	3° F.
March	19 Days	12 Days	7° F.
April	9 Days	2 Days	25° F.
November	12 Days	5 Days	8° F.
December	24 Days	18 Days	9° F.

Here we find that at least 72.5 per cent of the days of the four coldest months are 32 deg. Fahr. or below, and of the six months under consideration, 60 per cent of the days are 32 deg. Fahr. or colder.



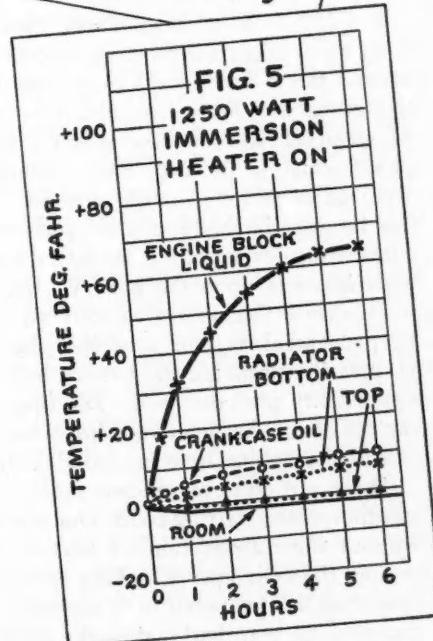
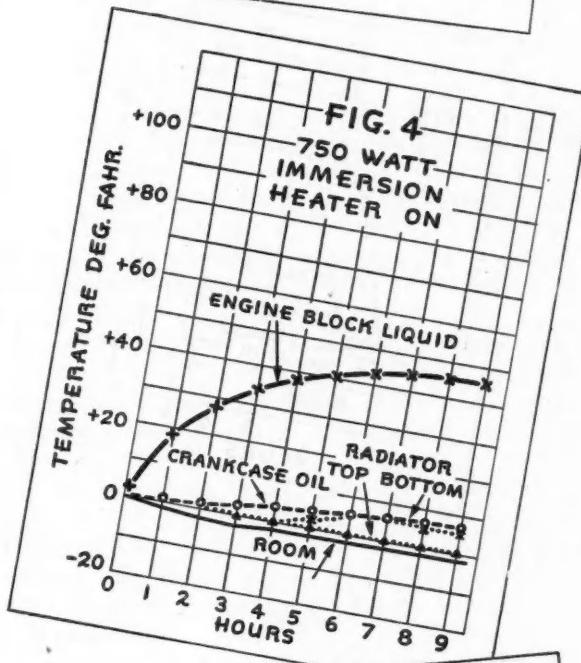
at sub-zero temperatures attention to battery performance is essential. To operators in areas where temperatures of 20 and even 40 below are not uncommon the tests described here indicate a course of experimentation which should provide them with data useful in their own operations.

This article is a revised version of a paper presented by the author at the 1945 War Engineering Meeting of the SAE.

by EMIL P. GOHN

Automotive Engineer, The Atlantic Refining Co.

zero start can be made in 21 sec. by
in 66 sec. with liquid heated to 36



HEATING TIME FOR COLD WEATHER STARTS UNDER PRESCRIBED CONDITIONS

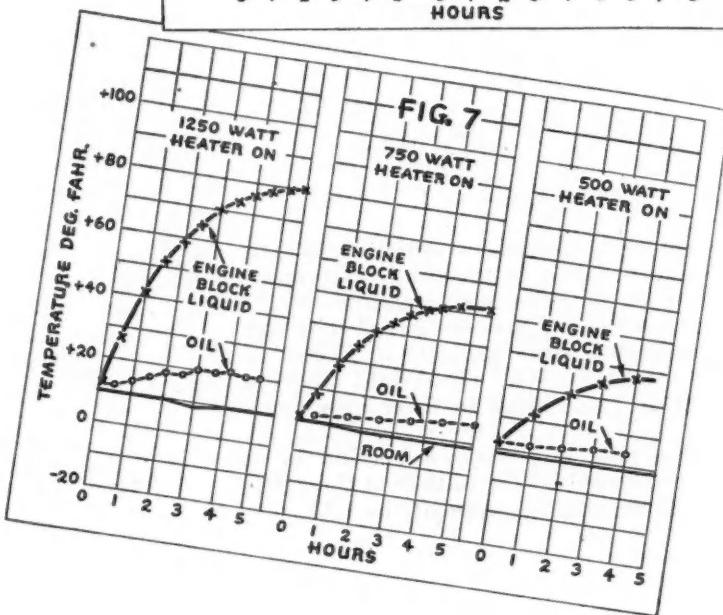
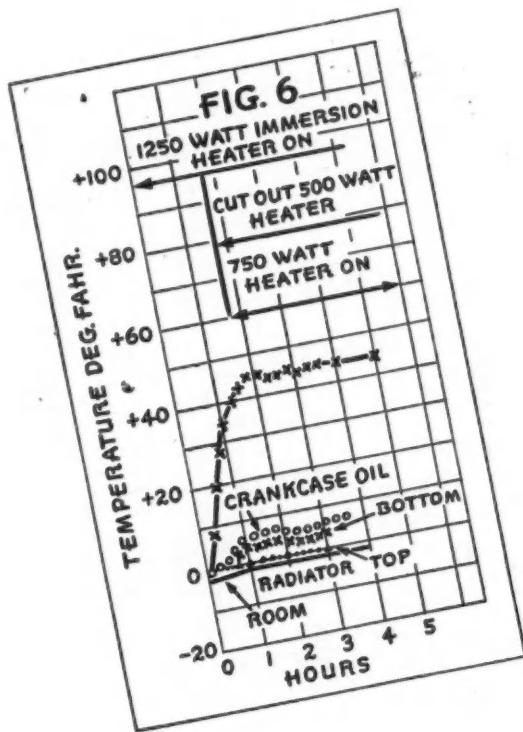
Oil Grade	SAE 20-20W			SAE 30		
	-2	9	20	-2	9	20
Outside Temperature (° Fahr.)						
Block Temperature Desired for Easy Start	44	36	33	65	45	40
With Engine at Outside Temperature, Number of Hours Heater Must be on to Reach Desired Temperature With:						
1250-Watt Heater	2	.75	.50	5	1.25	1.0
750-Watt Heater	7	1.50	1.0	(x)	2.5	2.0
500-Watt Heater	(x)	3.50	1.5	(x)	(x)	5.0
250-Watt Heater	(x)	(x)	4.5	(x)	(x)	(x)

(x) —Heater inadequate.

Weather data also reveal that Philadelphia has encountered temperatures of -5 to -11 as recently as 1932.

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Cold Starting with Immersion Heaters



(CONTINUED FROM PAGE 43)

The tests also indicated a sharp drop in battery performance where we reach sub-zero temperatures of the

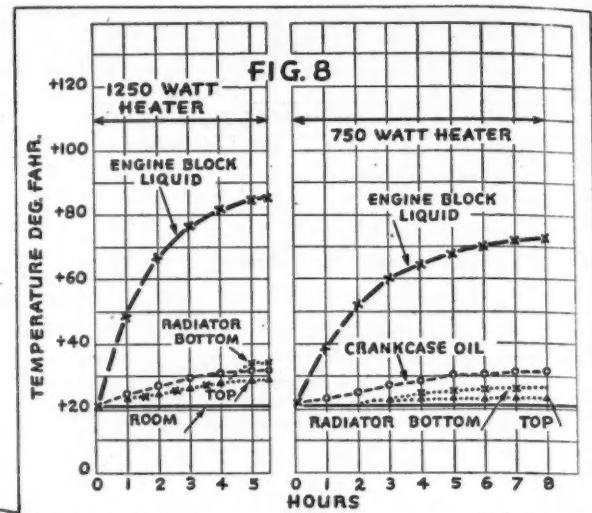
Summarizing the results of this study, it is apparent that the electric immersion heater installed in the block water jacket affords a relatively simple and economical means of improving engine starting for equipment stored outside or even in unheated garages.

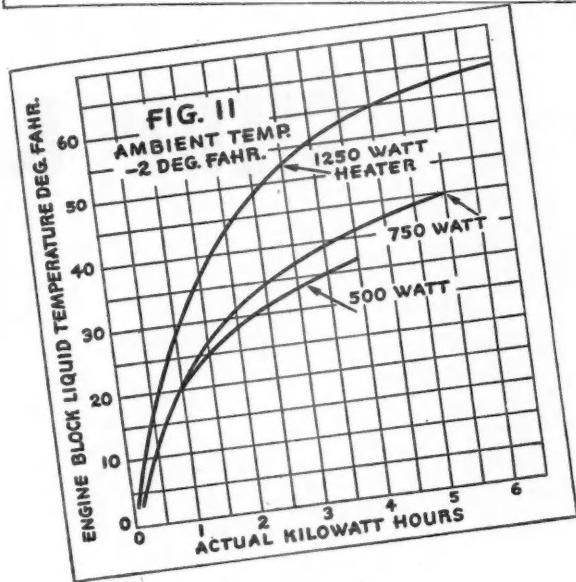
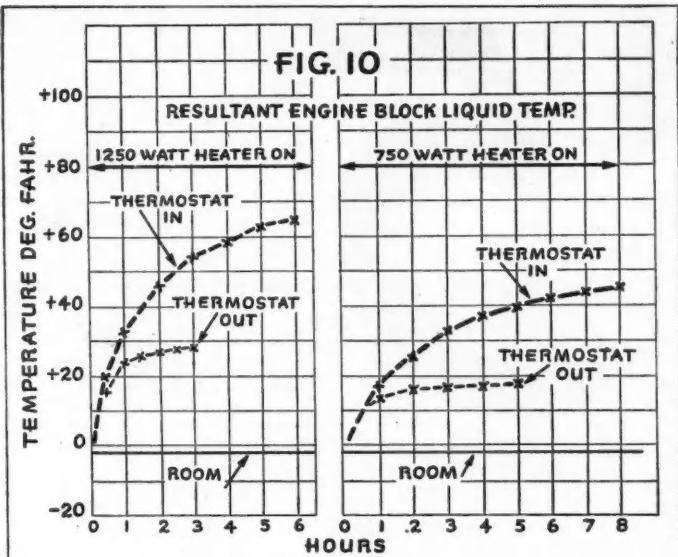
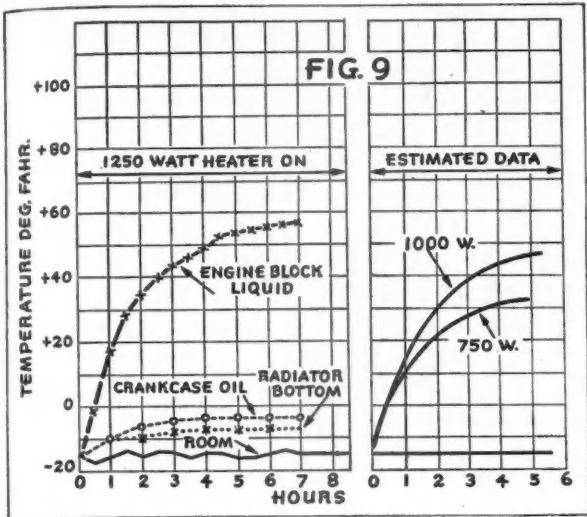
A direct result of starting equipment quickly is in the reduction of lost time of both the equipment and the chauffeur. Another benefit is quicker warm-up and better lubrication of the engine during starting and warming-up, which will be reflected in better maintenance costs.

Where sub-zero temperatures are quite prevalent, then attention to battery performance is also essential. This is a problem that is perhaps only to be confronted by vehicle owners in northern parts of the country, yet, even so, many vehicles are involved.

Test Procedure

The installation of the heaters offered no particular problem, and the location decided upon appears to have





met that requisite of applying the source of heat where it would do the most good on this problem. Since it is highly desirable to confine the heat to the engine block, it was found that the thermostat in the engine helped the problem by reducing to a large degree thermo-syphoning through the truck radiator.

The truck chosen for these starting tests was a cab-over-engine tank truck purchased in 1934, equipped with a 6-cylinder engine, $4\frac{1}{2}$ -in. bore by $4\frac{3}{4}$ -in. stroke, 6-volt electric system, employing a Delco-Remy starter, a regular 19 plate, heavy-duty type battery. Gasoline with a 74-octane rating was used in the tests.

The cooling system capacity is 40 qt. and approximately half of this quantity is in the block and water manifolds, which quantity of liquid is pertinent to heating by the use of the electric immersion heater. A line-type thermostat was installed in the outlet hose, close to the cylinder head. The physical dimension of the upper engine block gives a surface area exposed to radiation of approximately 7 sq. ft.

The choice of the type and size of the electrical heating unit was governed by the size of the water passages and

in respect to the watt capacity, it was decided to install two heaters for this test, one of 500-watt rated capacity, the other 750-watt rated capacity. These provided the individual capacities of each heater plus a total of 1250-watt capacity when hooked up in parallel. In addition, a resistance in series with the 500-watt heater provided a lower wattage where the tests indicated such data desirable.

Photographs show the 750-watt heater and its mounting in the inlet "ell" to the block, and how the heaters were installed in the engine block. It is quite apparent that the block lends itself quite readily to the installation of the heating units.

The location of the temperature measurement devices were, as follows: Two in the engine block, front and rear, two in the radiator, top and bottom, and one in the crankcase oil. The thermo-couples were conventional iron-constantan type and temperatures were read directly on a potentiometer.

Before taking the truck to the Cold Room for the tests, it was checked carefully for engine compression, condition of distributor points, new spark plugs installed, carburetor cleaned and overhauled, choke control checked and engine fuel pump tested for good operation. The truck was removed from regular delivery service and the above precautionary work done to eliminate any variables from these sources, and to make duplication of test data easier.

A starting method technique was decided upon and carried out for all tests, one person being assigned to this particular phase of the work. Crankcase oil samples were obtained periodically for analysis, and new oil was introduced before each starting test. The same fuel was used for all tests and a laboratory inspection of the fuel, together with the inspections of new and used oils, will be found later in the report.

Current draw during cranking was obtained and battery voltage before and during cranking was also noted. Seven batteries were in continuous use during the program. In other words, we had a supply of recharged batteries always available for the various starting tests.

(TURN TO PAGE 70, PLEASE)

\$ 5



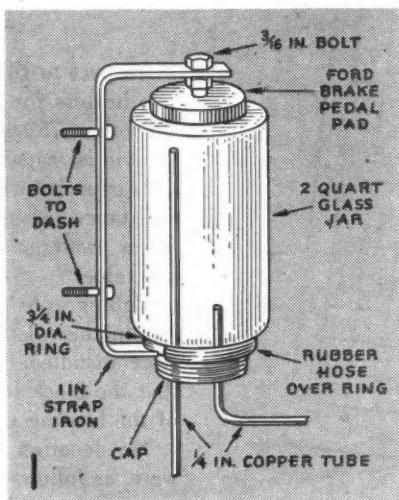
1. Radiator Overflow Tank

by Budd Shaulis
Continental Baking Co., Norristown, Pa.

We have had trouble keeping the required amount of anti-freeze in our older model trucks that do not have enough room for expansion of the liquid between the top of the core and the top of the radiator tank.

Here's a device we have found to be ideal in conserving the coolant. It is an expansion tank made from a two quart canning jar turned upside down and mounted to the dash above the motor with a bracket. The bracket is made from a piece of $\frac{1}{8}$ x 1 in. strap iron bent around to accommodate the jar as shown in the diagram. A hole is drilled 1 in. from one end of the iron and two holes 8 in. apart are drilled in the center. These two serve for the mounting of the bracket. To the other end of the bracket is welded a $3\frac{1}{4}$ in. harness ring covered with a rubber hose for the neck of the glass jar to rest on.

To hold the jar securely in place we took a Ford brake pedal pad, drilled a $\frac{3}{16}$ in. hole just through

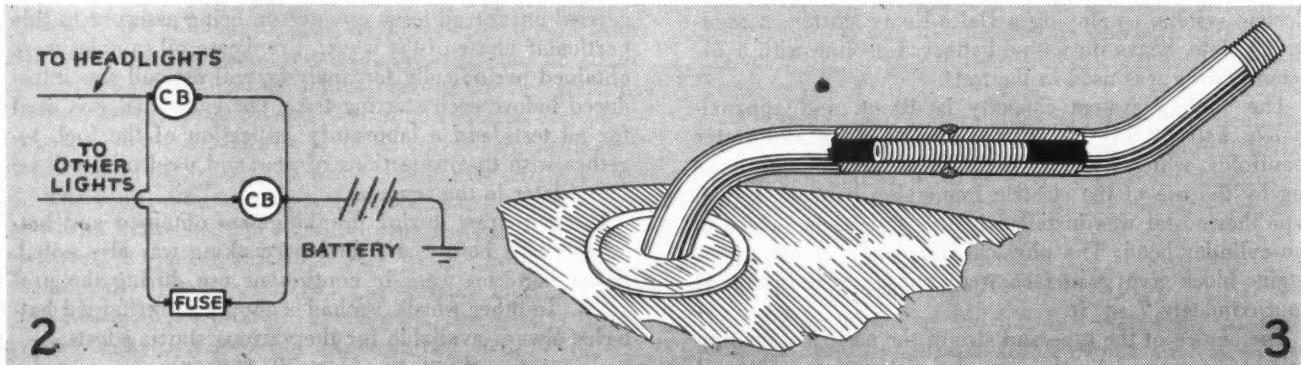


the metal, and placed it on the base of the jar. We inserted a $\frac{3}{16}$ in. bolt with a nut run down on it through the end hole of the bracket and turned another nut down on the bolt to act as a lock. The end of the bolt was fitted into the drilled hollow of the brake pedal pad to hold the jar in place.

SHOP &

We drilled two holes in the cap of the jar to accommodate two $\frac{1}{4}$ in. copper tubes. One, about 12 in. long, was inserted to the top of the jar with the lower part protruding 4 in. This became the overflow. The other tube was inserted just through the cap, and both were soldered to the cap. This second tube was attached to the overflow of the radiator.

This devise is also handy in checking the amount of radiator fluid. A compression leak can also be detected by watching the air bubbles in the jar, and of course the presence of oil would indicate other engine troubles.



Commercial Car Journal will pay \$5.00 for acceptable shop hints and \$5.00 for parts salvage tips. Send in as many ideas as you have to the editor. Don't underestimate your ideas.

Let the editor be the judge. A photograph or a rough sketch and simple explanation in your own words are enough. CCJ will polish them up for publication.

SALVAGE *Hints*

2. Revised Wiring

by L. G. Ramage
Continental Oil Co., Denver, Colo.

The circuit breakers on our Ford trucks have caused us a great deal of trouble lately. The points are always separating at the most unexpected and dangerous time.

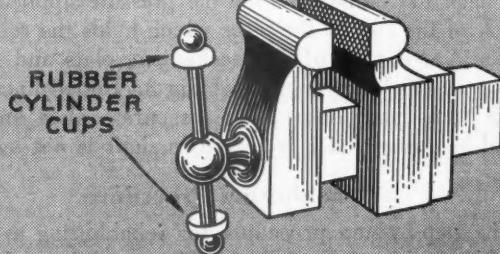
To avoid this trouble we have installed a fuse block with a 20 amp. fuse in parallel with the headlight circuit. This fuse still provides a safety link in case of short, and at the same time, overcomes the nuisance of the circuit breaker breaking the circuit for no good reason.

3. Valve Stem Repair

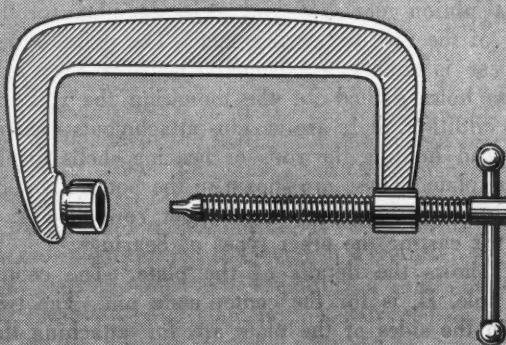
by Claire E. Ellsworth
Ellsworth Sales Co., Eagle Grove, Iowa

If new valve stems are not available, here is a method which can be used to salvage the old one.

With a hacksaw, cut the old stem off $\frac{5}{8}$ in. from the base. Cut off the core end of an old valve stem in the same relative place so that the overall length of the stem will be the same. Then tap both stem air passages first with 6/32, then 8/32, and finally 10/32 in. machine screw tap and run it about $\frac{5}{8}$ in. in depth. Take a 10/32 in. steel tubing and thread



4



5

with a 10/32 in. machine screw die. Bevel both ends of the stem about $\frac{1}{4}$ in. deep so that this groove will hold the solder. Now screw the tubing into one stem and then turn the other stem down snugly against the edge and solder.

We have repaired tubes without removing them from the rim in this manner.

4. Rubber Guards For Vise

by Frank E. Seftchick
Swift & Co., Brooklyn, N. Y.

To prevent fingers getting pinched when using a bench vise, we use discarded hydraulic brake wheel cylinder rubber cups for guards. With a gasket punch we punch a hole in the center of the cup and slip it over the ball of the vise handle. It not only prevents getting the hand caught but also eliminates noise.

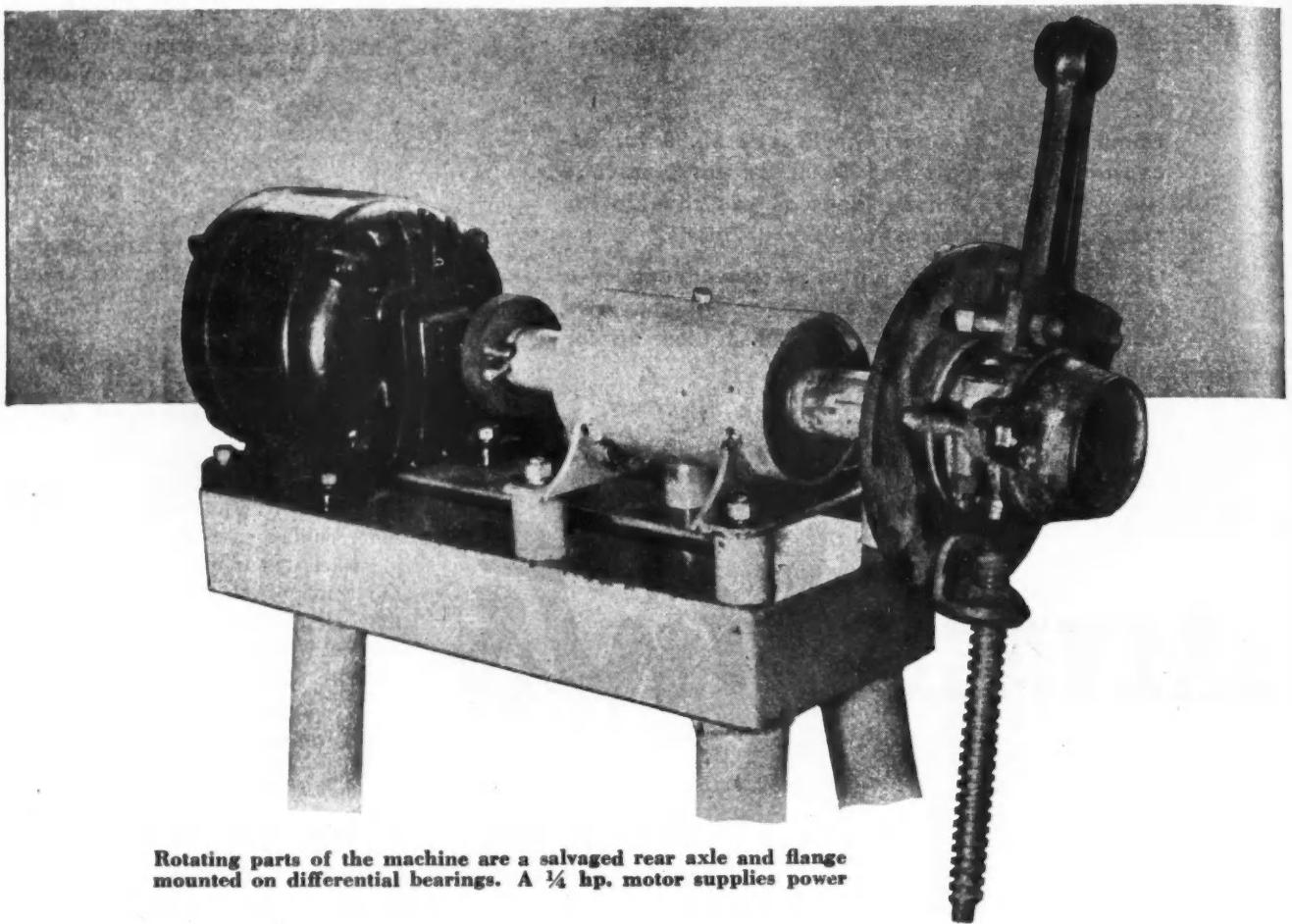
5. Clamp For Removing Rivets

by Budd Shaulis
Continental Baking Co., Norristown, Pa.

Here is a home-made clamp we use for removing hinge rivets in the cowl ventilator when it has to be taken off for repair. It can be used in many other places around a shop when hammering the object is inadvisable.

We obtained a C clamp and cut the swivel end off the screw. We ground the end of the screw down so that it would be smaller than the rivet to be punched out. We flattened the end so that it wouldn't walk over the edge of the rivet when clamped down.

We place a small socket on the fixed end of the C clamp so that the head of the rivet can be punched through it. Now we simply place the clamp over the rivet and turn the screw down slowly. A little pressure will do the trick that seems impossible with a hammer and punch.



Rotating parts of the machine are a salvaged rear axle and flange mounted on differential bearings. A $\frac{1}{4}$ hp. motor supplies power

THE rebabbitting of a connecting rod, crankshaft or camshaft bearings of the shell type can be done on a simple home-made machine made from salvaged auto parts. Such a machine has been working successfully for two years in our service department. It is shown in Fig. 1 with a newly rebabbitted connecting rod.

The bearings are cast on the centrifugal principle. The rod or bearing shell is clamped to a circular plate attached to a shaft turning at 1300 r.p.m. Molten babbitt is poured through an opening at the front of the machine and is thrown over the surface with such force that it adheres securely.

The machine consists of a $\frac{1}{4}$ hp. electric motor, an 18 in. shaft mounted on double row ball bearings from a differential pinion gear shaft and a circular plate for the mounting of the rod or bearing shell. The plate, which in this case is simply a salvaged Chevrolet rear axle flange, has holes drilled for the mounting the rods or shells. In addition, there are various attachments used in centering and holding the rods or bearing shells firmly against the plate. These are shown in the bottom row of Fig. 2. Other jigs, shown in the upper row of Fig. 2 are used for casting the other types of bearings.

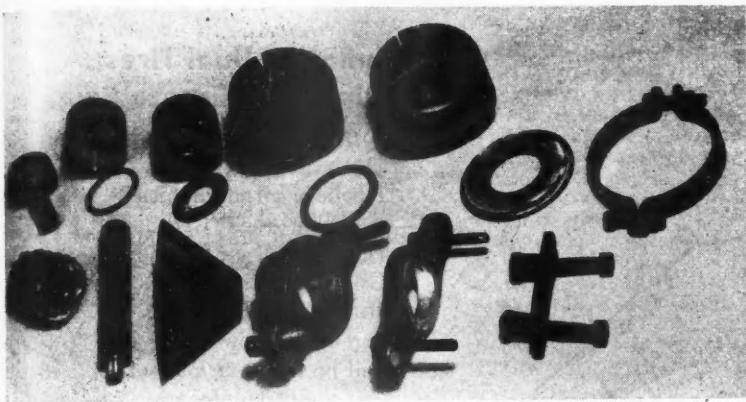
Fig. 3 shows the details of the plate. The center threaded hole, D, is for the center cone pin. The two holes C, in the sides of the plate are for attaching the

Home-Made

sealing plate. The small holes, E, at the bottom of the plate are for mounting the balancing screw which can be seen in Fig. 1. The slotted holes, B, accommodate the adjustment of various size rods. The two holes, A, at the top are threaded for a bolt which is turned in from the back to compensate for the pressure applied to the shank of the rod by the piece which holds the rod to the plate. A side view of the mechanism, plate and shaft is shown in the lower portion of Fig. 3. Dotted lines where shaft joins plate show how a separate plate and shaft could be assembled if a rear axle shaft is not available.

Rebabbitting Procedure

The step-by-step procedure for rebabbitting a bearing on this machine is as follows: The metal from the bearing shell or, in this case the connecting rod, is first



A simple machine assembled from salvaged parts, plus a motor and a few jigs, enables a Mexican to salvage connecting rod, crankshaft and camshaft bearings

by GENARO CONGORA

Service Department, General Motors de Mexico, Mexico City, Mexico

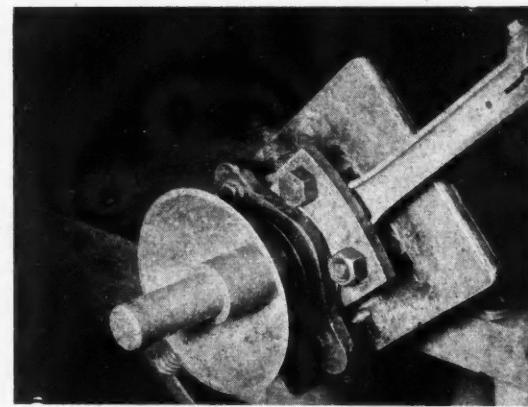
Much the Rebabbits Bearings

melted off with an acetylene torch or a small gasoline torch. For this purpose the gasoline torch has proved more economical, if slower. Muriatic acid thinned with tin is used for cleaning the surface. Any conventional cleaning method may be used.

The surface of the bearing is then tinned by melting thin bars of half and half solder with the gasoline torch. Other tinning methods may prove equally effective.

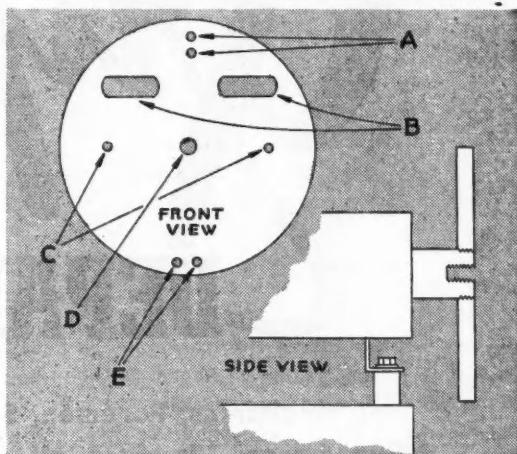
To cover the two lubricating holes of the rod, two iron cones within the size range of these holes are used. They are driven in from the inside of the bearing and set with a light hammer. This makes the bearing casting "molten tight". Centrifugal force keeps them in place.

Velumoid gaskets 1/32 in. thick are cut to fit between the plate and the inside of the rod, and between the outside of the rod and the sealing plate. These gaskets



Among the various attachments of re-babbitting machine is the centering cone, (third from left) centering pin, (second) and sealing plates on the lower row. The jigs and devices above are used for molds

Above, a former model of the machine shows how the rod is positioned with centering cone and pin. Below, drawing of front and side views of drum shows where devices are attached.



eliminate leaking of the metal while the rod is spinning.

The rod is now placed on the plate, the cone pin is turned into the center hole, and the centering cone is slipped over the pin. The centering cone is pushed up to the rod housing as tightly as it will go. This action centers the housing on the head with respect to the axis of the shaft.

The holding plate is fastened over the shank of the rod and bolted to the plate. The pressure compensating bolt on the other side of the head is tightened down on the shank of the rod. The centering cone and the centering pin are now taken out, since the rod is held in the centered position by the clamp. The sealing plate is placed over the outside of the housing and bolted securely to the plate. The plate is now balanced on the shaft

(TURN TO PAGE 186, PLEASE)



THE Gripe DEPARTMENT

**For Mechanics, Foremen, Superintendents,
Supervisors—in fact all connected with
the maintenance and operation of fleets,
who want designers to give more thought
to making post-war trucks easier to main-
tain and repair and less costly to run**

COMMERCIAL CAR JOURNAL WILL PAY

FOR EVERY GRIPE PUBLISHED

**AND each month one of the Grips will
receive an extra award of a**

\$10

\$25

WAR BOND

**, READ . . . the letters on this page and you'll get
a clear idea of what it's all about . . .**

**THEN . . . pull out a sheet of paper and, for
gripe's sake, gripe and get paid for doing it!**

Inflating Dual Tires, Dip Stick, Freeze Plug

**THE GRIPE DEPARTMENT,
DEAR SIRS:**

I believe all mechanics feel that the "Gripe" Department of the COMMERCIAL CAR JOURNAL is rendering a real service and we all hope the gripes registered will be taken seriously by the designers and manufacturers of postwar cars and trucks.

\$10
▼

I am wondering if the fellow who designed the rear dual wheels on a truck ever tried to air the tires on a winter day when the temperature was about zero? There just isn't enough room between the spokes to get to the inside valve and consequently these tires are run under-inflated many times because the driver lets it go.

Also, the axle bolts and rear wheel bolts are too small to hold up as they should. This weakness frequently results in ruined wheels and hubs.

Brother mechanic Milo R. Shuck of Sioux City, Iowa, mentioned the fact that oil dip sticks are too dirty for drivers to handle. I would like to add that this oil dip stick is located in such an ungodly place on some vehicles that it is practically impossible to replace the dip stick without using a flashlight to locate the hole. We hope an oil gage will be employed to eliminate this trouble. Also, the oil filter pipe is buried on some models. Perhaps the designer could better locate these oil filler pipes. Many fuel pumps and gas lines are also poorly located and inaccessible for this reason.

Some models have a freeze plug located at the rear of the motor. This freeze plug, or core plugs as they are sometimes called, are very poorly located. The plug costs only ten cents, however, the labor charges to install one of these plugs is about \$13.75 (and should be nearer \$25.00), whereas we feel the designer could surely do something to eliminate this particular gripe by relocating this plug.

The motor supports on many models are entirely too light to do the job and many have only half enough bolts to hold them. And why do universal joints have hidden grease fittings? About three-eighths of an inch

"The Gripe Department" invites fleet mechanics and all others connected with fleet maintenance and fleet operation to send in their gripes. For every griping letter published in this department, COMMERCIAL CAR JOURNAL will pay \$10. In addition, the best letter each month will receive a \$25 War Bond. The choice of letters for publication and for the War Bond will be made by the Editors of COMMERCIAL CAR JOURNAL. Their disposition of letters will be final. Choice will be determined by the content of the letters and not by style of writing or appearance.

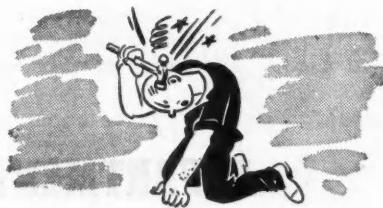
Here is a chance for every fleetman to tell the designers of post-war trucks what is wrong with trucks as they have been built and how post-war trucks should be designed to cut down maintenance time and maintenance costs.

Here is every fleetman's chance to get his ideas over to all of the big shots in the truck industry; presidents, sales managers, engineers and servicemen.

Here is an opportunity for fleetmen to influence post-war truck design along lines that will make their jobs easier and more pleasant.

Address your letter to THE GRIPE DEPARTMENT, COMMERCIAL CAR JOURNAL, PHILADELPHIA 39, PA.

mercial vehicles, making them uniform for weights and other standards that now remain so conflicting.
MICHAEL J. STASKO, f 1/c (Mo. MM)
U. S. S., P. C. 613
c/o Fleet Post Office
New York City, N. Y.



of clearance would make them much easier to grease.

At this time, the writer would also like to agree with Mr. Edward Young of West Chester, Pa., regarding the standardization of screw heads and bolt heads.

For my own particular operation, it would be simply wonderful if someone would produce a marker light which would stand up for more than one trip.

Here's hoping the designers of future models will overcome most of the faults, which have been "flies in mine soup" for mechanics in general.

HENRY B. HURLA,
Fleet Supt. & Chief Mechanic,
Sonken-Galamba Corp.,
Kansas City, Kan.



C.O.E. Inaccessibility and Fifth Wheel Alarm

THE GRIPE DEPARTMENT,
DEAR SIRS:

I have been away from the truck fleet field the last 15 months. Previously, I spent 14 years with an eastern organization, so please accept this experience as my basis to gripe.

The man that designed the cab-

\$10

over-engine unit I am sure never worked on one. There are times when you have to raise the cab to work on them. I have seen a 10-minute job on a conventional unit take all day on a c.o.e. I am sure I wouldn't take one for a gift if I had to work on another one. In fact, I have seen men give up their jobs whenever they were requested to overhaul them. These are out of the picture unless the people who manufacture them will redesign them.

Even though most heavy-duty manufacturers offer a variety of gear ratios, seldom is the proper ratio available. Of course, the use of two-speed axle and three-speed auxiliary transmission has been able to handle this to some extent.

Redesigning of practically all post-war cabs must be remembered whenever a person is in a crumpled up position. He soon grows fatigued and his mind is definitely not on his work. So, I propose redesigning and also using better materials in all cabs not only for the driver's comfort but also his health.

Another device I would ask some level headed person to design would be an electric alarm so arranged as to give off a warning noise whenever the fifth wheel isn't properly locked.

There's no man in the field who can't tell you a few stories how they ruined a few trailers by dropping them when loaded.

The only other gripe I now have to offer is this: When will our government enact laws pertaining to com-

Outline for a Better Store-Door Delivery

THE GRIPE DEPARTMENT,
DEAR SIRS:

My thanks to you for your kindness in considering my "Gripe" for your very interesting and informative department.

It has been my good fortune to have been a steady reader of the COMMERCIAL CAR JOURNAL for many years, and have been helped immeasurably by the knowledge and information contained in the various articles by learned experts. The thought has occurred that COMMERCIAL CAR JOURNAL through its unequalled contacts would be in an enviable position to influence postwar truck construction.

A real need exists in the industry for a specialized store-door delivery unit. The units now available fall into roughly, three classes:

- Light duty
- Conversions
- Standard jobs, special bodies

All of these classes have shortcomings that make them a real delivery and maintenance problem.

Class a. Fine for very light duty, such as florist, cake delivery, etc., bulk, but no weight.

Class b. Conversions are an unsatisfactory middle of the road compromise.

Class c. Standard panel jobs present big problems in loading and unloading deliveries, etc.

And all of these classes have one thing in common. They usually are maintenance problems, due to not

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\$10
AND
\$25
BOND





(CONTINUED FROM PAGE 51)

being designed for the type of service in which they are being used. The need is for a simple, well designed, reasonably costing unit, embodying maximum load space, ease and comfort of operation, adequate strength and power, and stressing simplicity of maintenance, no trick gadgets or fancy overhanging bodies. Such a unit would be a boon to such industries as milk, bread, laundry, etc.

Through past experience a few pertinent facts in the mechanical make-up of such a truck present themselves, such as:

Motor

A good, powerful, four cylinder motor providing a dependable source of power, something about $3\frac{3}{8}$ in. bore or a little less developing maximum power at medium engine speeds, large valves easily serviced, large cooling areas, easily dropped crank-cases, accessories, such as filters, distributors, generators, starter, etc., mounted where they can be checked without excessive labor costs. Engine unit should be assembled and mounted so that a complete replacement could be made in a few hours.

Gasoline System

Carburetors designed for extensive idling, economy, and if possible with large, hard-to-clog jets. Gas tanks of 16-gal. capacity, with deep water or foreign matter sump, simply mounted so that changeover can be made in $\frac{1}{2}$ to $\frac{3}{4}$ hour, either a gravity feed or sealed fuel pump mounted near the tank away from heat to eliminate vapor lock.

Exhaust System

Eliminate back-breaking, temper-busting jobs on frozen pipes and mufflers by substituting flange joints on all exhaust piping, instead of slip-on pipes now prevalent.

Cooling Systems

Large, strong radiators mounted so that minimum time is needed to replace a leaking unit without removing shell, water pump, fan or hood. Special curved hoses should be eliminated and hose clamps placed so it doesn't take a contortionist to remove them. Water pumps need redesigning to simplify service and make possible repacking without dismantling, or a real sealing packless pump.

Fan belts and all V-drive pulleys should be standardized as to pitch, etc., and adequate adjustments provided to receive long belt life. Adequate provision should be made to facilitate block cleaning and flushing.

Brakes

There is a need for large size service brakes with large inspection holes for lining and anchor checking, and an emergency lockout valve in case of line breakage. Redesign of master cylinder installation for ease of repair and replacement. Hand brakes should be mounted away from the grease, adjusted easily and be a real emergency brake, capable of stopping and holding a vehicle from 25 m.p.h.

Clutch

Single disc of large diameter, or some type of fluid drive or hydraulic, but must be easily serviced as clutches don't last too long in stop-start service. A type of clutch eliminating shifting if possible would be the ideal set-up.

Controls

A truck of this type should be controlled with possibly a single pedal and foot accelerator. Eliminate mechanical gear shifting and provide clear vision, adequate and accurate dash instruments, proper lighting facilities, both inside and outside of truck; easy-operating, draft-proof, folding side doors to provide large working space; wide lift-up rear doors to facilitate loading and unloading.

Miscellaneous

Solid waterproof flooring with adequate drainage, protected dome light wiring, simple functional fenders, strong bumpers and bumper brackets. Truck to be designed for sit or stand drive operation. Body posts, panels, etc., should be replaceable easily and cheaply. All wiring should be protected, if necessary even borrow the thin wall rustproofed tubing used in the electrical industry as loomng for all the wiring. Batteries need shifting to a more advantageous mounting away from motor heat and yet easily accessible for changing, water addition, etc.

These features and many more are most desirable to the fleet owner engaged in stop-start delivery service. It seems to be a forgotten fact, but the great majority of fleet owners would be willing to pay a little more for new trucks if they knew it was designed for their use, and in the course of the units life the extra cost would be absorbed by the savings in maintenance costs. The market for a really good truck of this type in the 1 and $1\frac{1}{2}$ -ton class is tremendous and would pay big dividends to the manufacturer who would really design such a unit.

My appreciation to you for the opportunity to express my views, and with best wishes for your continued leadership in the field, I remain

JOHN M. KAVANAGH,
Supervisor, Hegeman Farms Corp.,
Ridgewood, N. Y.

Full-Floating Axle Without Wheel Studs

THE GRIPE DEPARTMENT,
DEAR SIRS:

The weaknesses and imperfections of design found in today's so-called full-floating rear axles not alone comprise, but excite, this gripe. These undesirable characteristics, located at the junction of the axle flange and the hub, result from the fact that the axles are not what their name implies.

"Full-floating" is a misnomer. In fact, to class the design of today with any of the legitimate types would be incorrect. It is a hybrid, a cross-breed, very definitely the product of a surreptitious cross-mating of the

\$10

true full-floating axle with the three-quarters floating.

The qualities inherent in the true full-floating axle preclude any possibility of its causing the trouble and expense experienced in the use of this mongrel contrivance. This is true by reason of the fact that it provides a substantial means through which to transmit axle shaft torque to the wheel other than by the use of studs set in the end of a soft steel hub.

These studs are referred to as dowel studs. No amount of elasticity of the imagination would allow a comparison with a dowel, only, that the holes in the hub are drilled the exact size of the stud for a half inch deep before reducing the hole diameter to accommodate threads, using, thereby, a half inch of the stud length as a dowel.

Complete absence of slack between axle flange and stud is next to impossible. If an axle flange with 12 holes can be slipped over 12 studs it is because there is enough slack to permit it. To acknowledge the necessity for slack sufficient to allow this mating of the flange with all these studs at one time is to acknowledge that the nuts are expected to hold the flange tightly to the hub face and prevent the slack from becoming lost motion, or backlash, as the torque fluctuates or changes direction.

In attempting to draw the nuts tight enough to hold the slack, they are drawn almost to the breaking point. Each time this happens the studs are stretched a bit, and the threads in the hub distorted a little. Although the amount of the stretch is infinitesi-

Have You a Bone to Pick with the men who get out Factory Service Instruction Manuals?

What do you think of the service instruction manuals and bulletins that are issued by automotive manufacturers?

Are they useful?

Are they practical from the mechanic's point of view?

Do they meet his on-the-job requirements?

Or are they looked at when received and then tossed into a corner or drawer and referred to only occasionally?

In what form do you think service instructions should be prepared by manufacturers?

New postwar vehicles, parts, accessories and equipment will require new service instructions.

Now is the time for mechanics and shop foremen to tell factory service men how those instructions should be prepared for maximum usefulness.

Here's your chance to take a hand in guiding factory men to do the right thing by you.

For every letter published on this subject Commercial Car Journal will pay \$10.

In addition, the best letter each month will receive a \$25 War Bond. The choice of letters for publication and for the War Bond will be made by The Editors. Choice will be determined by the content of the letters and not by style of writing or appearance.

Address your letter to

THE GRIPE DEPARTMENT, Commercial Car Journal, Philadelphia 39, Pa.

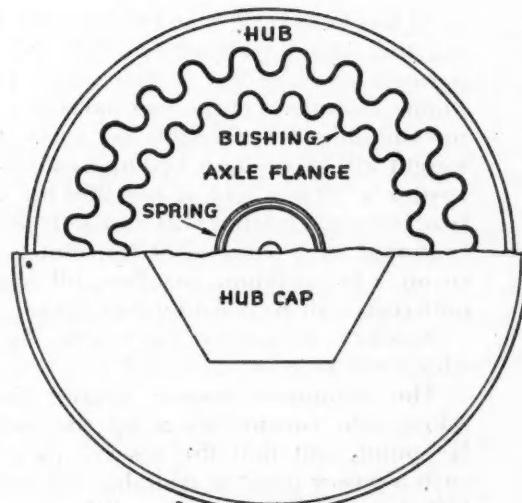
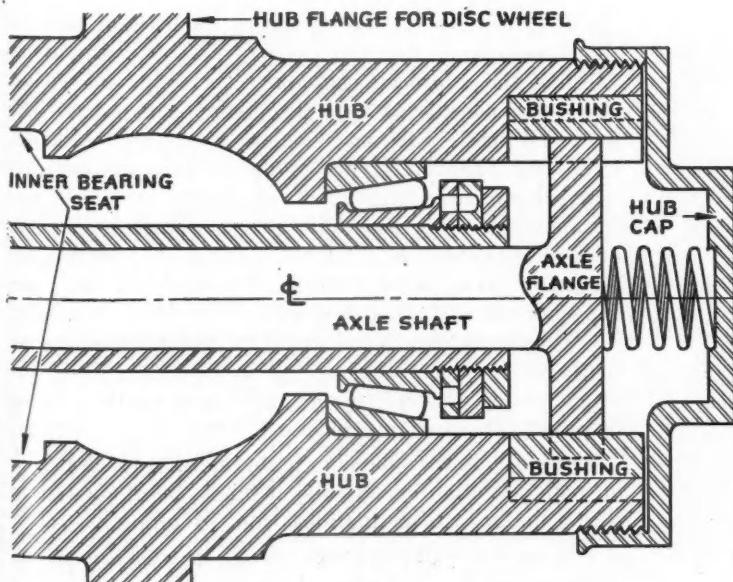
mal, it occurs at the stud's weakest spot and contributes greatly to the backlash between flange and hub. This backlash and its subsequent results are accumulative and hasten the final failure of the stud.

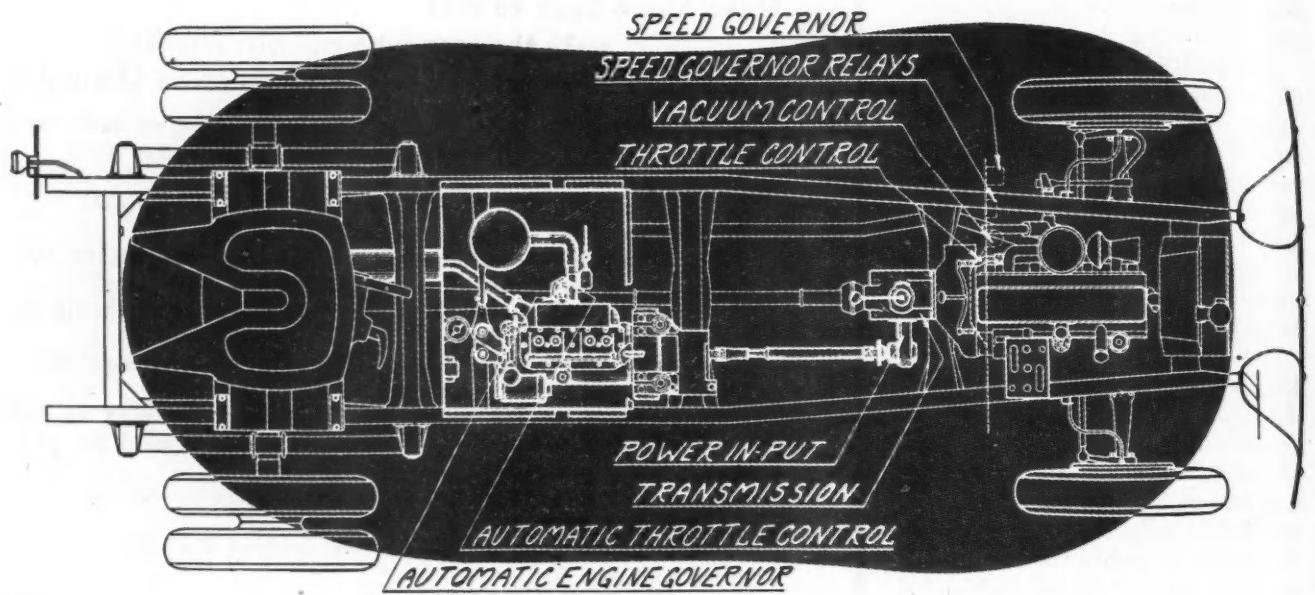
In an endeavor to find a remedy some manufacturers recommend replacement of the studs once a year. For the popular-sized trucks, an accessory manufacturer has placed a lock ring on the market. This fits on

the studs and actually locks the nuts.

Another manufacturer developed what is called a gear-type axle. This has the periphery of the flange cut like a gear and fits into an internal gear cut in a circular plate, which is held to the face of the hub by studs and nuts. This one could truly be called a full floating axle; but still there remain occasional broken studs to contend with.

(TURN TO PAGE 132, PLEASE)





Economics of Multiple Power Plants

Opportunities for saving in their construction and operation and for increasing

THE MAJOR FACTORS

At the 1945 SAE War Engineering Meeting the author pointed out that the comparative expense for constructing power plants and other component parts of a tractor suitable for 50,000 lb. gross train weight will show: Two 100 hp. engines will cost only 30 per cent of one 200 hp. unit; two 100 hp. clutches will run only 20 per cent that of a single 200 hp. clutch, and so on. In addition, gasoline, oil and repair costs will be considerably lower.

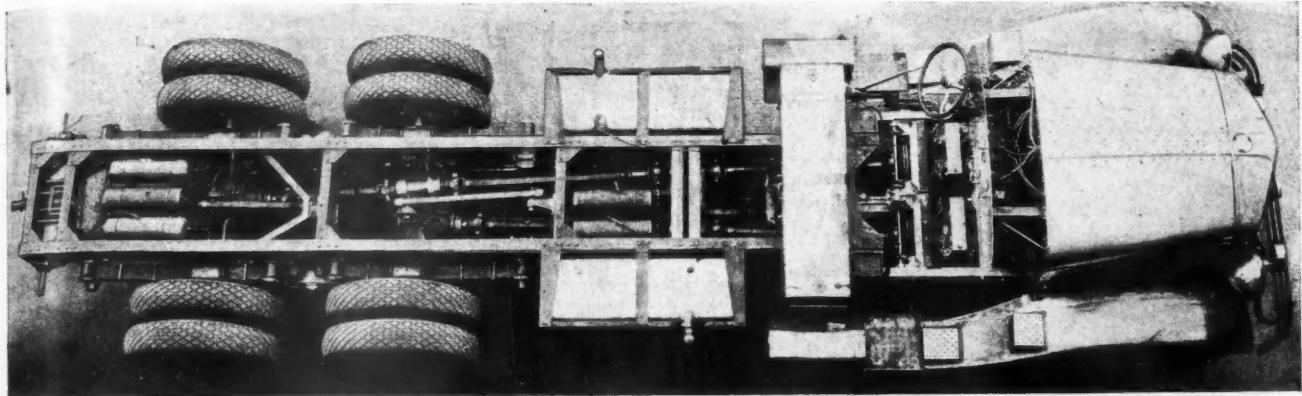
Another advantage is weight saving, which will increase pay loads.

The automatic booster engine also is taken into consideration by the author. He points out that the reserve power of such a power plant is available not only on hills but also when any condition imposes an extra load on the truck engine.

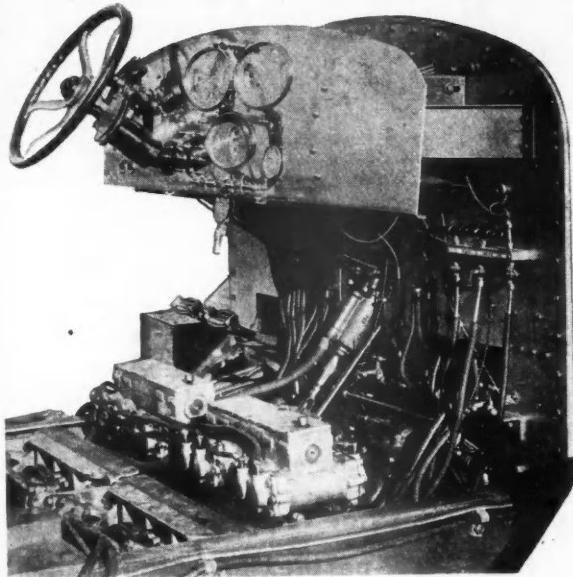
IN A discussion involving the possibilities of multiple power plants in motor trucks it would seem to me that the approach can, quite correctly and conveniently, be considered from two distinct viewpoints. The first, and possibly the most logical, would be the opportunity for financial saving in the original construction and subsequent operation of a vehicle, of given performance, deriving its motive power from two independent power plants as compared to that of a vehicle, of the same given performance, but embodying the more conventional design of a single power unit. Secondly, and equally as important, would be the opportunity for increased revenue to be derived from a specific vehicle by increasing its power by the addition of another engine or power plant for optional use.

I propose, in the following paragraphs, to touch briefly on both potentialities but first it might be of interest to sketch the growth of this idea from its infancy.

The use of multiple power plants in trucks is by no means a new or novel idea. According to my best infor-



Above, Fig. 2. The "Relay" job built by Garford has three axles and two 135 hp. eight cylinder engines. Each power plant drives its own axle. Left, Fig. 3. Close-up of dash and controls. Fig. 1, opposite page, automatic booster unit, an engine operating when extra power is needed



revenue by increasing power

by RALPH M. WERNER

Automotive Engineer, United Parcel Service

mation the idea was first applied by Daimler of Austria. Of more recent date we have the "Relay" job built by Garford around 1930, and is shown in Figs. 2 and 3. This was a three-axle unit equipped with two 135 horsepower eight cylinder engines. This job was an example of the form in which an extra engine was added to increase performance and consequent ton-mile production. It did not meet with wide acceptance when it was introduced. This was probably because labor rates were low, overtime uncommon, and the meager records and charts kept by operators did not reveal the possibilities of more effective equipment. Another reason is that, generally speaking, manufacturers succeed best in filling

a demand. The designer of this job was so bold as to anticipate by several years a genuine need. If my memory serves me correctly, in this particular case the designer became too enthusiastic and legislators did not keep pace with his ideas of size and capacity.

I recognized the possibilities of multiple power plants as early as 1922 but did not actually get around to constructing one until 1934. Those I did finally construct were also of the three axle type; an engine driving each of the two bogie axles. My design placed one engine at the rear of the rearmost axle and the other just ahead of the first driving axle. Nevertheless, I had been preceded in this design by Bussing of Germany who had already manufactured some buses with the components arranged in almost an identical manner.

What degree of success these earlier vehicles obtained is not very well known to me with the exception, of course, of the ones I had experimented with. I presume that they, like mine, had numerous defects. As an illustration, the remote control device of those days was unreliable as it combined torsional as well as axial displacement. The torsional displacement of the frame, which flexed considerably, upset the register of shifting fingers and it was not an uncommon experience to have one transmission in low while the other was in third speed. Today, however, there are remote controls available which are neither influenced nor affected by this chassis flexure. This, of course, has come about in the normal improvement of vehicles in general. Other faults have likewise been solved and eliminated from the picture. Finally, is the successful and proven application of multiple power plants in numerous aircraft, marine and railway designs, the advantages of which are all probably well known to most of you.

Equal Power Comparison

I think their relative merits can best be demonstrated by an actual comparison. Therefore, in line with our first proposition, let us consider the comparative expense for constructing the power plants and other component

(TURN TO PAGE 154, PLEASE)



Questions Arising in Reemployment of Veterans

Selective Service officials dealing with the problem provide truck operators with answers to pertinent questions which will more than likely perplex and plague them

EDITOR'S NOTE: In the following Major Henry M. Gross is chief of Veterans Personnel Division, Selective Service, Harrisburg, Pa.; Major Hughes is legal adviser to the Division, and Herbert Talmon is Vocational Rehabilitation Director, Veterans Administration, Philadelphia. To avoid errors in transcription Majors Gross and Hughes availed themselves of the opportunity of editing their remarks prior to publication.

MAJOR GROSS: Section 8 of the Selective Service Act, after providing for the establishment of the Veterans Personnel Division to carry out its provisions, states that any man or woman enlisted, inducted, or commissioned into the armed forces, who has obtained an honorable discharge, regardless of the time of service, is entitled to his or her—we will say the veteran and say him—is entitled to his old job if, first, he has an honorable discharge; second, if his job was other than temporary; third, if he applies for it within 90 days from the date of his separation and undertakes the work of that job or position within 90 days; and lastly, if he is able to perform the duties of that position.

(Note: On December 8 the law was amended to extend from 40 to 90 days the period within which a veteran

may make application for reinstatement in his former position. It was further amended to provide that application for reinstatement may be made within 90 days following release from hospitalization, provided such hospitalization follows immediately after separation from service and extends for a period of not more than one year from date of separation.)

Those are the conditions set up by the Act for replacement in the former job.

If the old job does not exist, then a veteran who had other than a temporary position is entitled to a job of like seniority, status and pay, unless the condition of the employer has so changed as to make it unreasonable or impossible—not inconvenient—to so re-employ him.

If a man is restored to his old job or the job of like seniority, status and pay, he is entitled to keep the position for one year and can only be discharged for cause—not misconduct—the law says “cause.”

He may be only discharged for cause, which is ordinarily whatever may be agreed as a reason between employer and employee for separation from the employment of the employer.

The veteran coming back to that old job or the equivalent job is as if he had been on leave of absence. Instead of having been a year and a half or two years overseas his status is as if he had gone away last week

DO YOU KNOW THE ANSWERS?

1. What constitutes an application for reemployment?
2. Who gets the job if a succession of employees in a particular job is drafted and subsequently discharged?
3. Under what circumstances can a veteran be fired before his one year of compulsory employment expires?
4. If a veteran is refused reemployment and wins out in court is he entitled to back pay or a year's employment, or to both?
5. Can a cash settlement in lieu of reemployment be arranged?
6. How are seniority lists affected?
7. Must the salesman-driver be given his former route?
8. Under what circumstances is the veteran entitled to upgrading?
9. How does a fleet operator get the right to train veterans as drivers or mechanics, and how much can he be paid while learning? How much does the Government contribute?

These and other pertinent questions are answered in this stenotypist's report of a meeting conducted by the Philadelphia Chapter, Pennsylvania Motor Truck Association, at which Selective Service and Veterans Administration officials exposed themselves to the questioning of truck operators. Fleet operators will find the answers informative and a helpful guide.

and come back this week. In other words, he continues to receive the benefits, or he has accruing to him a status which, when he undertakes his job with his employer, carries with it all that it would have carried, except for skill-upgrading; it carries with it all the benefits that it would have carried if he had been continuously in the employer's employ during the period of absence.

If the veteran coming back applies for his old job and for some reason the employer feels that the veteran is not entitled to the job, there may be an honest difference of opinion as to whether the job was a so-called permanent job or a temporary job.

It is perfectly possible that the employer, as has happened, doesn't want to reemploy veterans. Suppose you find such a case or the case where there is an honest difference of opinion. The veteran, if he feels that his position was a permanent one, that he is entitled to it or the equivalent, should go to the reemployment committeeman, who is the representative of our division, in every local draft board.

He should explain the situation to him and ask for his help. If the reemployment committeeman would find it was too tough, he would go to our coordinator of reemployment committeemen, coordinator of the Veterans Personnel Division, who is adviser to those reemployment committeemen.



If they should find that it could not be settled easily by agreement, then the veteran has the right to go to the United States Attorney nearest to the place of business of the employer, and present his case to him. If the United States Attorney feels that the case has merit, he will prosecute that case in the nearest United States Court, present it to the court, and submit it to the judge for trial and decision. If the judge finds that the man's case was just, he may rule

that the veteran be reemployed by the employer and that any amount of wages lost between the time he applied for his old job and the time he obtained it or its equivalent—be paid to the veteran by the old employer.

That, in brief, is the summary of Section 8 of the Selective Service Act and it seems like a perfectly simple thing when you just go over it that way; but it has a number of words and a number of statements which continually need clarifying, and for a year our division has been meeting those situations and attempting to clarify them. Major Hughes is the legal adviser to this division. On him falls the burden of interpreting those parts of the Act which from time to time become involved beyond the ability of a layman to interpret; and also, when necessary, to advise the veteran on his rights and assist him through the United States Attorney in protecting those rights.

MAJOR HUGHES: We have had over 75,000 discharges in the Commonwealth of Pennsylvania. To date we have not had a court case arising out of Pennsylvania; we have had some cases that came very close to it.

We have had some cases that involved honest differences of opinion that we are going to talk about because it is only by discussing actual cases, problems within your industry, that we will know how to avoid them.

(TURN TO PAGE 110, PLEASE)

FREE Publications

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USE THE POSTCARD

A selected list of the latest in literature—books, pamphlets, catalogs—chosen to help fleet operators solve maintenance and operating problems

L226. Filter Manual

Proper servicing of lubricating oil filters and fuel oil filters, while seemingly a minor operation, will contribute materially to engine life. This 38-page manual in its outline of proper procedures in this service, will make the reader conscious of the need for care of filters. A step-by-step diagnosis of oil filter troubles, is made with emphasis on the precautions to be taken in the checking for leaks in lines and removing lines for inspection.

Comprehensive instructions are given for installing any make and model of lubricating oil filter. Accompanying photographs will help to make the job more simple.

The other division of the book concerns diesel fuel oil filters, their use and abuse. Directions are given for locating troubles in this type of filter, and corrective measures are outlined in detail.

A few minutes' time spent in reading this manual might save many hours of labor and many repair bills later. Get a copy now by writing L226 on the postcard.

L227. Operation Booklet

There's hardly a fleet operator who couldn't use one or several extra trucks in his operation. Inasmuch as trucks, new or used, are difficult, if not impossible to get, increased production per vehicle is the best solution to the vehicle shortage problem.

Even an extra $\frac{1}{4}$ -ton load or one

more delivery per day would add up to the equivalent of one or more trucks in the fleet if each existing vehicle could be more productive.

Just how this may be achieved is the theme of a new 8-page booklet being offered to the fleet operators. It describes 10 ways of getting more production from the trucks that make up the present fleet. One suggestion, for example, involves a reduction of loading time and shows how it has actually been done by one operator who cut his loading time 50 per cent. The suggestions are practical and show a thorough understanding of truck fleet operators.

This booklet is yours for writing L227 on the free postcard.

L228. Engine Valve Manual

Here is a 16-page booklet dealing with troubles due to sticky and burned valves. There are many owners who have been looking for just this sort of information on the causes and prevention of these troubles.

The booklet is technical in its approach to seven causes of valve breakage, but practical corrective measures are outlined in down-to-earth style.

Another part of this publication is devoted to methods of grinding valves. Photographs and diagrams illustrate points so well that even the less experienced man can follow the instructions for a better valve job.

The supply is limited. Get your copy now by writing L228 on the free postcard.

L229. Cooling System Manual

Here is a 26-page, government manual entitled, "The Cooling System: Cleaning, Flushing, Rust Prevention, Anti-freeze." Few manuals are so comprehensive in their discussion of this subject. Every possible point where trouble might develop in the cooling system is discussed. Numerous photographs and diagrams illustrate the points discussed.

Suggestions for maintaining a standard liquid level in radiators and methods for testing the thermostat are shown. Another section is devoted to a diagnosis of overheating and overcooling of the engine, common complaints in many trucks.

Since cooling system corrosion has been a headache to many operators, the suggestions here on its prevention and the hints on cleaning and flushing should be of great value.

This booklet is a must for every fleet shop. Write L229 on the free postcard for a free copy.

L230. Brake Drum Booklet

This 20-page illustrated booklet deals with a comprehensive study of brake drum performance from the standpoint of premature failures caused by excessive heat generated through inferior drums, faulty maintenance or improper linings. This accumulated knowledge acquired from a series of dynamometer tests on brake drums to show the effect of heat should be of interest to truck

(TURN TO PAGE 197, PLEASE)

NEW Products

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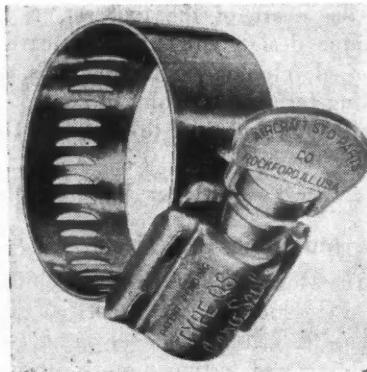
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**The newest in replacement parts, accessories, shop equipment and supplies.
For more details of products described or advertised, use free postcard**

P1. Non-Rust Hose Clamp

New all-stainless steel Aero Seal hose clamps, designed for service where conditions require highest corrosion resistance, are now in production at the Aircraft Standard Parts Co., Rockford, Ill. At present, production is in only the most popular sizes, M12, M16 and M20, but the



line will gradually be increased.

Although lighter and thinner, the stainless steel bands are said to have greater strength and flexibility than carbon steel clamps, and have the advantage of being made entirely of rust-resisting material. A new mechanically interlocked saddle permits elimination of welds at that point.

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P2. Synthetic Tube Lube

Recognizing that the mounting of synthetic inner tubes requires a different treatment than the mounting of inner tubes made of natural rub-

ber, the Amalie Division of L. Sonnenborn Sons, Inc., New York, has introduced a new product known as Amalie B. G. Compound, specifically designed for use in mounting synthetic inner tubes.

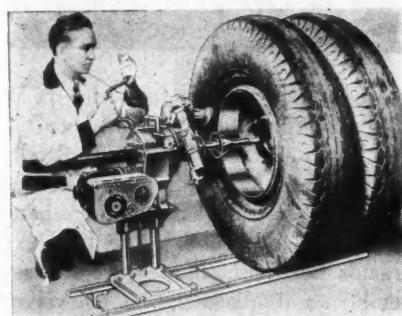
The new lubricant is a compound of medium soft consistency made of pure vegetable oils and does not contain ingredients that are injurious to synthetic or natural rubber.

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P3. Brake Drum Lathe

Barrett Equipment Co. announces a new combination stationary and portable brake drum lathe.

This unusual device makes it possible to machine heavy brake drums without lifting either the wheels or lathe from the floor. It will accurately handle and turn any drum from motorcycle size to the largest truck or bus sizes with the tires on or off, and

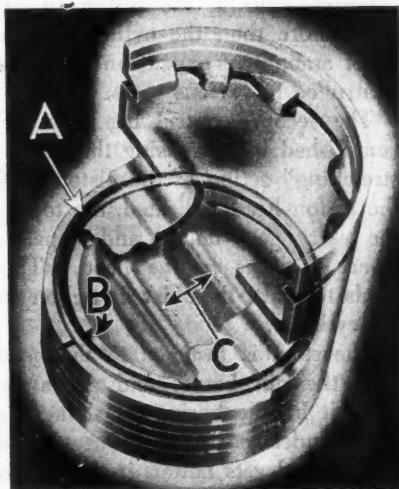


eliminates the necessity of hoisting heavy work for mounting on overhung shafts as is customary with conventional lathes. These machines are

now available with WPB approval.
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P4. Diameter Control Piston

The new Diatrol piston manufactured by the Toledo Steel Products Co., Toledo, Ohio, gets its name from the type of work it was designed to



do, diameter control. The manufacturer claims that due to its positive control of the diameter at block temperature, it saves oil, eliminates scuffing and scoring and wears longer than an ordinary type piston.

Thermal expansion control has been accomplished in two ways. First, a continuous steel band is inserted around the top of the skirt. (See A.) This band expands very much like the cast iron of the cylinder. When all parts are heated, the aluminum
(TURN TO NEXT PAGE, PLEASE)

NEW Products

CONTINUED FROM PAGE 59

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BETWEEN PAGES 58 & 59

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skirt expands more than the steel band, but it slides around the band and causes the slot at B to close up, thus leaving the steel band in control of the circumference of the piston at the top of the skirt.

The aluminum body of the piston has considerable strength and stretches the steel slightly as it heats. The steel band gets hotter than the cylinder, causing the piston to expand more than the cylinder. The exact amount of expansion has been controlled in various ways.

The second control has been accomplished by increasing the "hoop-stretching" action of the piston. As the piston head is heated, the top of the skirt gets hotter and expands where it joins to the head. This tends to make the skirt fit tighter in the cylinder.

The skirt is fastened to the head over the pin bosses and cut away from it by the horizontal slots over the cylinder-bearing portions so that as the head gets hotter, it exerts two opposite influences on the skirt. Due to thermal expansion, it tends to expand the skirt along one diameter, and due to the "hoop-stretching" action, it tends to contract it along the longer diameter of the cam-ground piston. The heavy rib (C), helps to increase this "hoop-stretching" by expanding and pushing on the pin bosses.

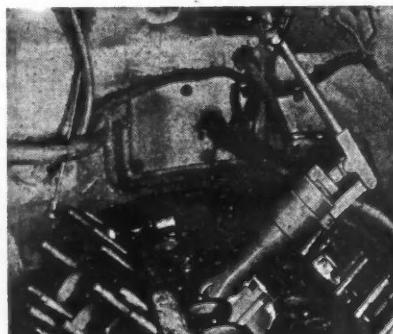
These pistons, it is said, do not tighten up when the engine is forced to pull for long periods of time with the throttle wide open. According to the manufacturer, when the aluminum

gets hot and expands, instead of pushing out against the cylinder and scrubbing the walls, it is held in by the steel band and only scrubs enough to keep the oil scraped down. It will not flex under pressure nor cock in the cylinder. The pistons are quiet and provide for more heat dissipation according to Toledo.

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P5. Ford Valve Tools

A new tool will soon be available to fleetmen. It is a hydraulic jack and accessory set for removing Ford



valves. It is manufactured by TCM Mfg. Co., Maywood, Ill., and is called the Hydramek Ford Valve Tool Set.

The Hydramek Set consists of the hydraulic ejector jack and jack handle, valve lifter and guide lock extractor bar, assembly fixture for assembly and disassembly of valve, valve guide, spring, valve and valve keeper, a set each of the spacing slips, and holding wedges.

The valve assembly comes out and goes in as a unit. A very important

feature is the ease with which it can be taken out without damaging valve, valve guide, keeper, or guide lock, so that any of these parts not worn excessively can be used again.

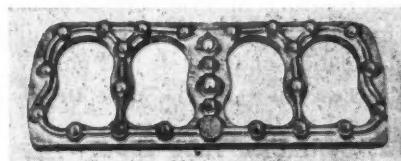
The manufacturer reports that only 30 to 40 minutes suffice to remove a set of 16 valves in any engine regardless of how tightly some of them may be stuck in the block, a time saving of from 50 to 75 per cent.

The hydraulic ejector jack, which is the heart of the tool set, is of unique design and sturdy construction, developing up to 7500 lbs. of lifting force at the point of contact—more than sufficient to push out the tightest valve.

Use Free Postcard For More Details.

P6. Moguloid Test Head

The Moguloid Test Head, developed by Moguloid Co. of America, Chicago, Ill., is used in salvaging, rebuilding and testing motors. It has been designed for the purpose of pressure testing motor blocks for leaks and to enable the mechanic to thoroughly check each part of the motor with the cylinder head removed, or to check the cylinder head



itself. This test head is invaluable for testing seepage after the cracked block repair, after sleeves have been

P8. Plastic Pedal Pads

A rubber-like plastic covering for automotive brake and clutch pedals is now being produced in quantity by the Bay Mfg. Division of the Electric Auto-Lite Co., Bay City, Mich.

The pedal pads, which are being molded in various sizes, are designed to replace worn ones made of hard-to-get rubber. The pads are ridged, allowing for a firm grip by the driver's shoes and are grooved inwardly to fit tightly over the bare steel of the pedal.

The manufacturer claims that this black flexible plastic product is far superior to pre-war rubber types.
Use Free Postcard For More Details.

P9. Water Distiller

Ordinary water can now be transferred into the chemical equivalent of distilled water by a simple filtration process developed by American Cyanamid and Chemical Corp.

With these units, trade-marked Filt-R-Stil, water which is virtually mineral-free can be produced for storage battery and other uses. The principle of the Filt-R-Stil is one of filtration by utilizing melamine-derived and other resins developed by this company. Water is passed through beds of these ions exchange resins which transform the dissolved salts in the

installed, or when water is found in the oil reservoir.

Mogul Test Heads are light in weight, aluminum cast equipped with pressure gage and air connector and may be easily and quickly installed on a block for testing.

Use Free Postcard For More Details.

P7. Electrode Heater

The Pacific Engineering Corp., Los Angeles, is now marketing the Mor-Weld, a new type of electrode holder. One of its innovations is the heat-resisting "everlast" plastic jaw cover designed to give longer service. An additional economizer of time and money is Mor-Weld's flexibility which enables the welding rod to be con-



sumed down to a mere stub without the necessity of bending.

The quick change, lever-action jaws can be replaced in less than a minute without tools. All parts are quickly interchangeable because there are no pins or bolts. This allows for fast servicing and cleaning.

This holder is said to be "air conditioned," keeping cooler under continuous operation. It also can be removed quickly from cable so that the welder can place his personal electrode holder in his locker at night, out of the way of possible damage.

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water to the corresponding acids and, in turn, absorb the acids.

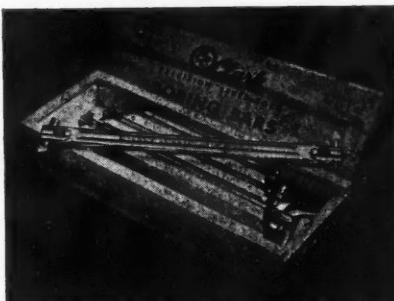
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P10. Lever-Lock Boring Bar

Just announced by the Robert H. Clark Co., Beverly Hills, Cal., is the Clark Precision Lever-Lock Boring Bar. According to the manufacturer, these new bars provide an answer to the need for a bar with a separate tool bit for small diameter holes.

They are available in sets of four— $\frac{3}{16} \times 5$ in., $\frac{1}{4} \times 6$ in., $\frac{3}{8} \times 7$ in., and $\frac{1}{2} \times 8$ in. These boring bars are designed for use without bushings or adapters and require no special clamps or holders. The parallel type Clark adjustable tool holders will hold them securely.

Leading manufacturers of tungsten carbide tool bits now supply solid round carbide bits in small sizes down to $\frac{3}{32}$ in. in diameter for use



in the Clark lever-lock boring bar. The lever-lock feature securely grips the tool bit in such a way that boring or threading to the bottom of a hole is possible without interference from set-screws or bolts.

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P11. Bearing Boring Machine

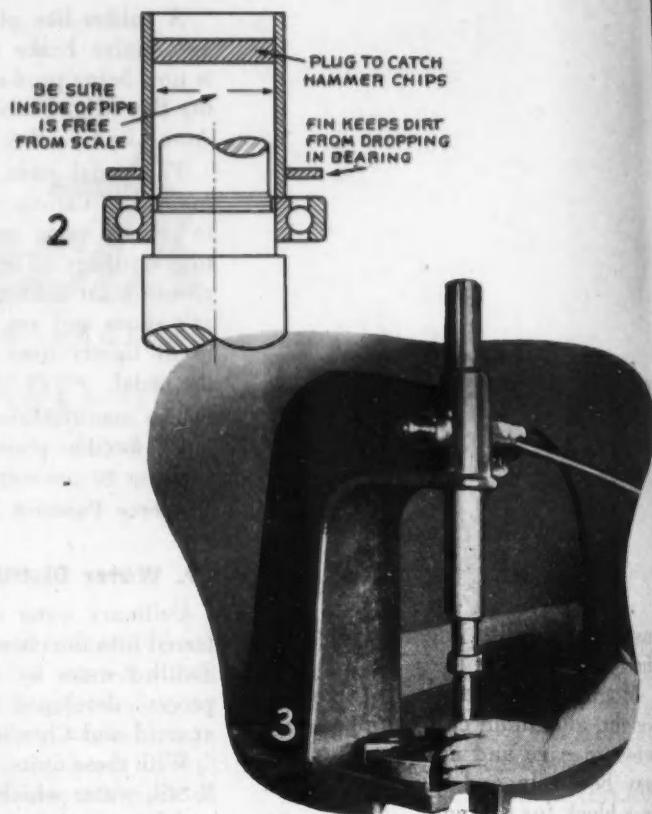
The Tobin-Arp shell bearing boring machine, model SB, is a completely equipped unit, with a motor drive, hydraulic feed, direct reading micrometer, the necessary cutting tools and a set of adaptors to hold all bearing shells. It eliminates the necessity of carrying a large stock of under-size or over-size bearings. Any counter man who can read a micrometer is able to operate this machine to bore individual bearing shells to any predetermined size. They can be turned to a mirror finish, the manufacturer states, in less than two minutes.

The machine features steel saddles to hold the bearing firmly in place, a new clamping arrangement which enables the operator to bore all bearings of equal wall thickness, and a new designed drive head and feed

(TURN TO PAGE 142, PLEASE)



Fig. 1. Bearings can be removed or installed with hammer and drift pipe. All tools should be clean and care taken that chips do not enter bearing. Fig. 2. The soft drift pipe should contact the inner ring only. It should be held securely and struck squarely so that the shaft threads are not damaged. Fig. 3. When using a press, both races should be supported and pressure applied evenly to the shaft



Making Ball bearings Roll Out

Care in removal, correct seat grinding, proper installation are major factors in long bearing life. Hot air assembly is preferable to pressure, or hot oil

IN ADDITION to the care in handling ball bearings stressed in last month's article, four precautions should be observed in removing bearings from the shaft.

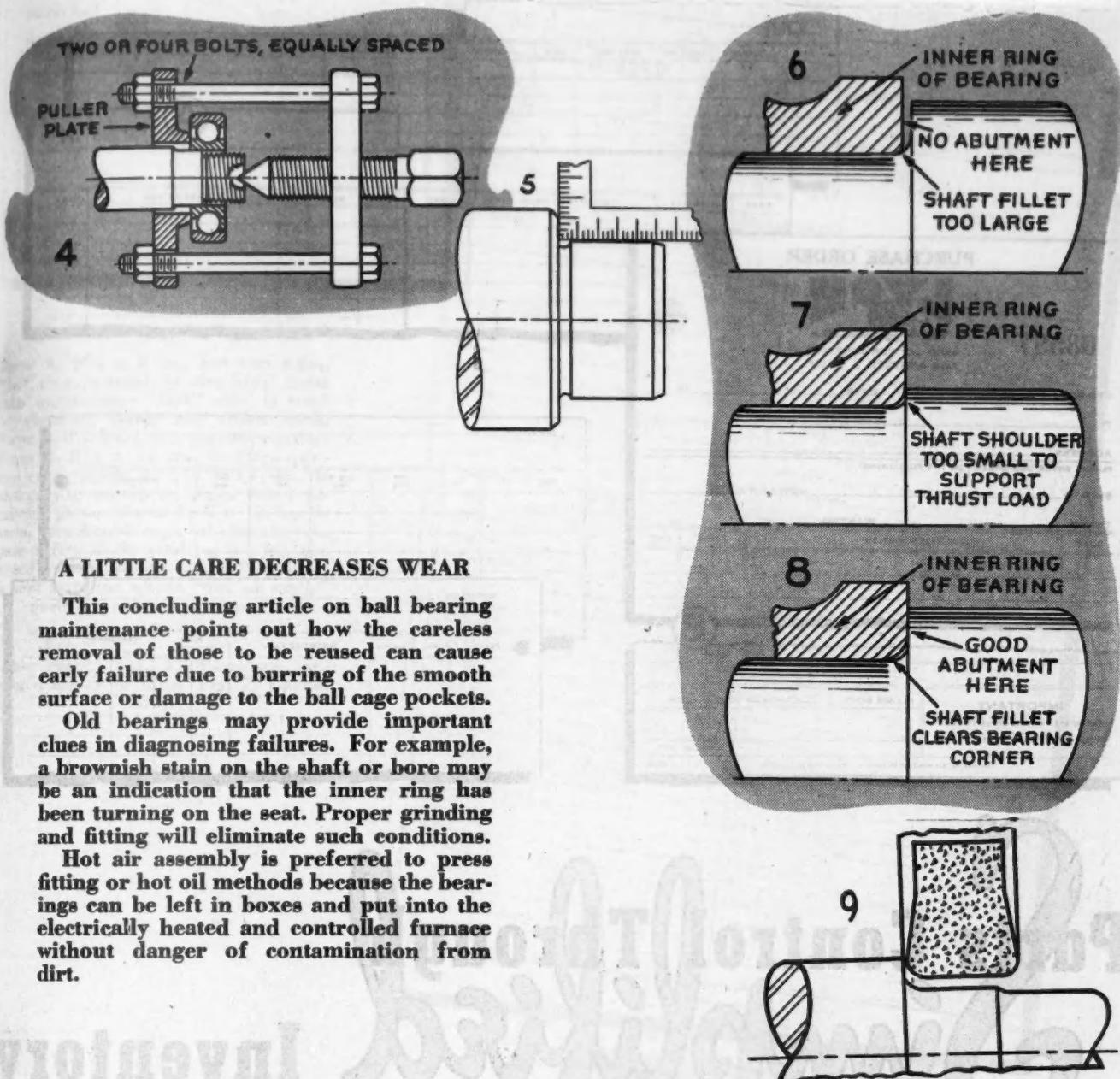
1. Care should be taken that the bearing or bearing seat is not damaged.

2. The bearing should be laid on a clean paper after removal.

3. It should be washed in the manner described previously, if it is dirty.

4. After washing it should be oiled and wrapped in a clean paper until it is to be used.

It is more difficult to remove a bearing from a shaft than to put it on. In many cases the damage resulting from careless removal is not readily noticed, but here is what can happen. The race groove surfaces may become roughened, due to dirt or metal getting into the bearing



A LITTLE CARE DECREASES WEAR

This concluding article on ball bearing maintenance points out how the careless removal of those to be reused can cause early failure due to burring of the smooth surface or damage to the ball cage pockets.

Old bearings may provide important clues in diagnosing failures. For example, a brownish stain on the shaft or bore may be an indication that the inner ring has been turning on the seat. Proper grinding and fitting will eliminate such conditions.

Hot air assembly is preferred to press fitting or hot oil methods because the bearings can be left in boxes and put into the electrically heated and controlled furnace without danger of contamination from dirt.

More Miles

PART 2

during removal. The shaft shoulder may become burred, which would prevent the bearing seating firmly when installed. The surface of the race grooves may be nicked by the puller against the outer ring or by forcing off with a hammer and chisel. And, finally, the ball cage may become damaged or the rivets or fingers loosened due to striking with a hammer.

Where the shaft is clear of gears or parts, the bearing can be removed with a drift pipe and hammer, or pressed off with a hand press. If a drift pipe is used, one of the proper diameter should be selected so that when it is

Fig. 4 shows one type of bearing puller using a split collar plate. Fig. 5 shows one method of checking the squareness of the shaft shoulder. Fig. 6. Instance where shaft fillet is too large for proper bearing seating. Fig. 7, shoulder is too small to support the bearing load. Fig. 8, correct shaft shoulder and good fillet clearance. Fig. 9. Double concave wheel for grinding shoulder

slipped over the shaft, the edge contacts the inner ring of the bearing only. See Figs. 2 and 3.

The pipe, hammer, and any other tools used should be clean so that dirt will not enter the bearing. In this method it will be found advantageous to chuck the shaft in the vise. A soft piece of metal should be used between the shaft and vise jaws to prevent scuffing of the shaft. Hammer blows should be applied to all sides of the drift pipe in order to drive off the bearing squarely.

A press can often be used to advantage to remove bear-
(TURN TO NEXT PAGE, PLEASE)

OUT						IN					
DATE	QUANTITY	TRUCK No.	SALES PRICE	DATE	QUANTITY	TRUCK No.	SALES PRICE	DATE	QUANTITY	TRUCK No.	SALES PRICE
NAME _____											
PURCHASE ORDER											
LYON  VAN LINES 1950 SO. VERNON AVE. LOS ANGELES 7, CALIF.											
08597											
CHARGE TO _____		DATE 19_____									
TO _____											
ADDRESS _____											
PLEASE ENTER OUR ORDER FOR THE FOLLOWING:											
SHIP TO _____		HOW SHIP _____									
TERMS		WANTED									
QUAN.		DESCRIPTION		PRICE	UNIT						
IMPORTANT PUT NUMBER OF THIS ORDER ON YOUR INVOICE, PACKING LISTS AND PACKAGES		PLEASE SEND _____ COPIES OF YOUR INVOICE BY _____									
PUR. AGT. _____											
REFORM-PACIFIC BOUNDING BOOK CO., INC., LOS ANGELES, CALIF. 4768A											

B

C

D

Parts Control Through Simplified Inventory

REPAIR parts stock control is important to any fleet owner. To Lyon Van Lines it is of vital importance because we not only have to keep a fleet of 86 over-the-road units in constant operation but, in addition, we built our own equipment as well. With only a total of 16 men in the mechanical department during the present year, besides maintaining our rolling stock we have added five units to the fleet, four tractors and a truck. These are all diesel powered and largely built from salvaged parts.

Add to this the fact that four years ago we were a small outfit with the mechanical staff consisting of myself and one other man. Our complete layout for maintenance work consisted of an open yard and a shack two by four for parts storage. But we grew. Then came the war. Tonnage jumped but where could you buy additional

by J. H. "TINY" BLOHM
Superintendent, Lyon Van Lines, Los Angeles

transport heavies to move it? So, we went into the truck-building business along with our preventive maintenance.

Parts became the order of the day. Where to get them. What to do with them. How to keep track of them. We bumbled along for a time having plenty of headaches with some hopes. Then, early in this year, it added up to revamping our whole mechanical layout. This modernization of the department was thorough and included

Form A, $5\frac{1}{2}$ x 8 in., has two sides. "In" side is used in checking parts into warehouse. "Out" side is used in checking parts out when used. Form B, 8 x 5 in., is a purchase order. Form C, $8\frac{1}{2}$ x 11 in., is office control card. Form D, $5\frac{1}{2}$ x $3\frac{1}{2}$ in., is charge slip mechanic signs when receiving parts. Form E, 8 x 11 in., is serial numbered copy of driver's repair order. Parts used on the job are noted on the reverse side. This form is sent to office where "out of stock" parts are entered on form C.

Lower right. Fig. 1. Parts are arranged neatly in bins. Fig. 2. Gasket cabinet

West Coast fleet departmentizes layout of shop and devises a system that keeps a constant account of parts stock with no conflict with the manpower problem

a sectionalized new building so divided that now we have each part of our mechanical effort housed by itself with the senior man in charge. There are a total of five such divisions—mechanical overhaul, general parts, engine, electric and body, in that order. General parts or main stock storage is directly accessible to mechanical overhaul through a "Dutch" door, but other sections are divided by solid partitions and distinctly separate, with

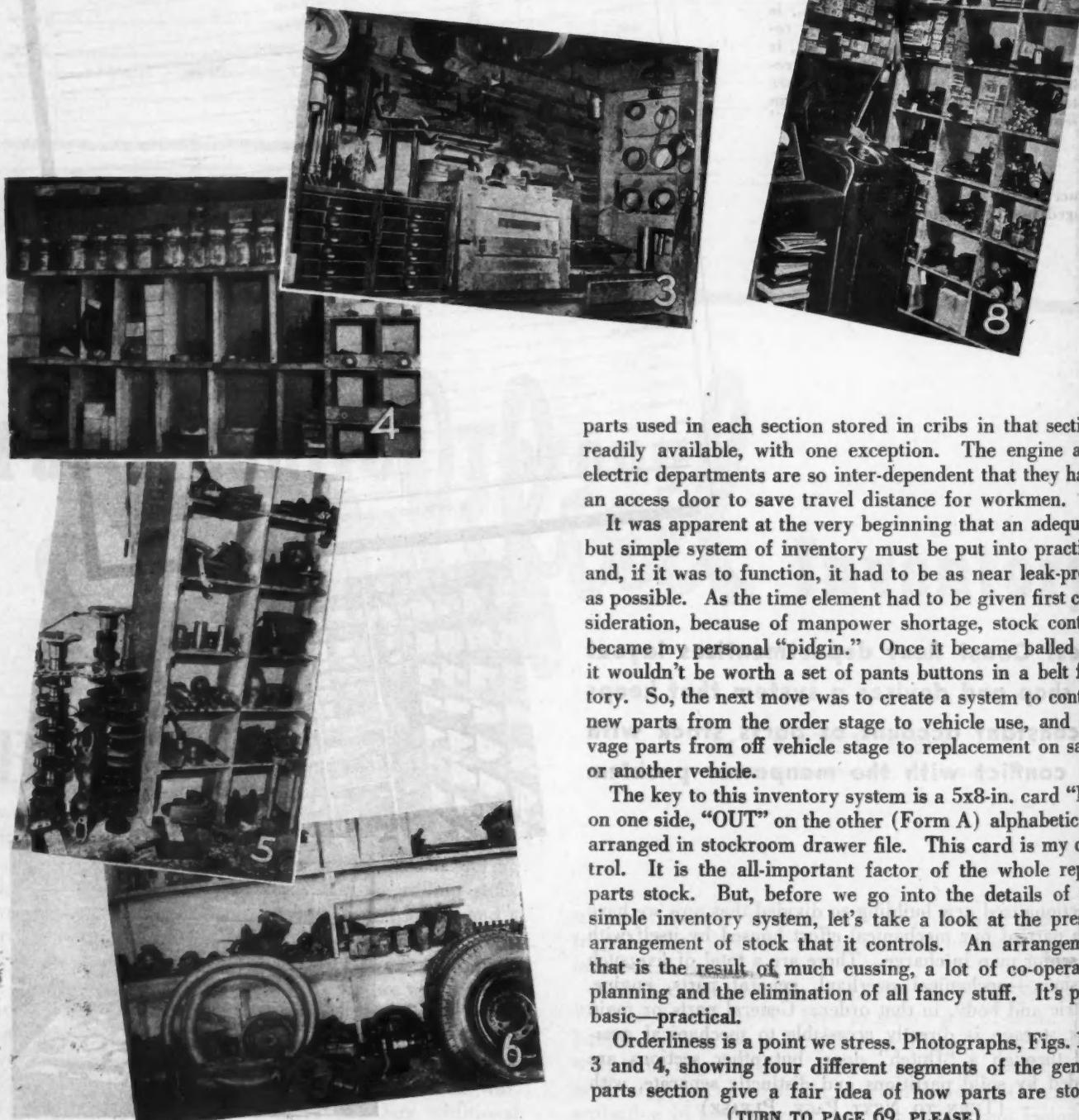
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Parts Control Through Simplified Inventory

(Continued from Page 65)

Fig. 3. Stockroom. Note special tools mounted on wall. **Fig. 4.** Many shelves and bins provide orderly parts storage. **Fig. 5.** Engine parts neatly arranged for immediate use. **Fig. 6.** Another section of the parts room. **Figs. 7 and 8.** Sections of electrical parts storage. Systematic arrangement speeds work



parts used in each section stored in cribs in that section readily available, with one exception. The engine and electric departments are so inter-dependent that they have an access door to save travel distance for workmen.

It was apparent at the very beginning that an adequate but simple system of inventory must be put into practice, and, if it was to function, it had to be as near leak-proof as possible. As the time element had to be given first consideration, because of manpower shortage, stock control became my personal "pidgin." Once it became balled up, it wouldn't be worth a set of pants buttons in a belt factory. So, the next move was to create a system to control new parts from the order stage to vehicle use, and salvage parts from off vehicle stage to replacement on same or another vehicle.

The key to this inventory system is a 5x8-in. card "IN" on one side, "OUT" on the other (Form A) alphabetically arranged in stockroom drawer file. This card is my control. It is the all-important factor of the whole repair parts stock. But, before we go into the details of this simple inventory system, let's take a look at the present arrangement of stock that it controls. An arrangement that is the result of much cussing, a lot of co-operative planning and the elimination of all fancy stuff. It's plain basic—practical.

Orderliness is a point we stress. Photographs, Figs. 1, 2, 3 and 4, showing four different segments of the general parts section give a fair idea of how parts are stored.

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Parts Control . . .

(Continued from Page 66)

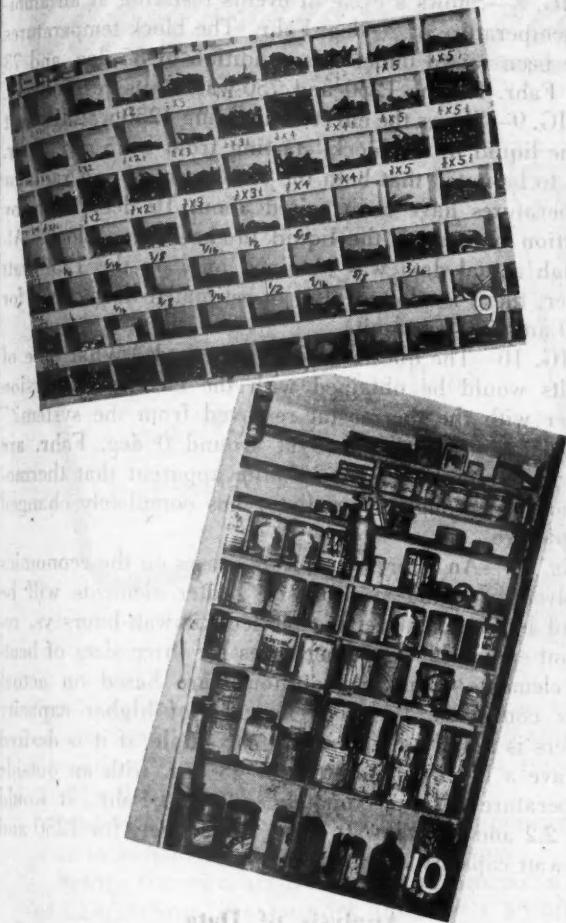


Fig. 9. Body hardware section. Fig. 10. The paint too is stored in an orderly fashion, reducing waste and fire hazard

Sequence of sizes is stressed and better marking of bins is planned as time permits. However, by constant use, familiarity with plan is built up until it is a simple matter to select any part with good despatch. The gasket cabinet shown in Fig. 2 is a great help in keeping gaskets clean and in good condition with any one quickly selected. At the same time, stock is checked at a glance. By marking each drawer with the name of engine the gaskets are for speed up delivery. And, by the way, that small drawer at the lower right of cabinet and alongside of open drawer is the heart of the whole inventory control. It's the permanent home of the before-mentioned Form A.

Engines are next. Figs. 5 and 6 are close-ups of two small portions. This section houses work benches and all equipment necessary for engine overhaul. Adjoining is the electrical section, Figs. 7 and 8. These two sub-departments work closely together and the general arrangement of parts is to keep the heavier on the lower shelves and the smaller parts in bins above.

In the body section parts are placed in larger bins as shown in Fig. 9. And, to complete the overall picture, Fig. 10 records a portion of the paint storage section.

Now that we have come along this far together, let's take a specific part, an important one, too—a fan belt—and follow it through.

I make out purchase order No. 08597 (Form B) for 25 No. 120 fan belts and send it to Frazier-Wright, local distributor. In due time they arrive with Frazier-Wright invoice and are checked into warehouse. Then, on Form A an entry is made on the "IN" side. The okayed invoice is sent to the office where it is entered on Form C and then charged to No. 1185 warehouse receipts. Let's suppose we are fresh out of No. 120 in local stock, so, we charge five to No. 4132 local stock receipts. The five belts are then moved from warehouse to local stock storage. My control card is now complete with two entries. It shows at a glance the total number on hand, from whom purchased and when received, the cost of each, and where they are. The exception to this procedure is that of heavy parts—engines, transmissions, etc. On receipt they are charged to No. 1185 warehouse receipts and entered on the "IN" side of Form A *only*. When needed they are charged direct to the equipment used on, with entry of same on "OUT" side control card.

To make our complete method clear we'll watch Bill who is checking No. 76 just in. And, of course, it needs a No. 120 fan belt (coincidence!). Bill fills out a Charge Slip (Form D) and I supply one No. 120 from stock, making an entry on the "OUT" card. Bill's signature on slip acknowledges the receipt. Bill applies the belt and enters the part supplied, and time taken, on the driver's form headed Repair Order (Form E). Each driver on arrival fills out and places one of these reports in the Repair Order Box.

I make a personal check of all repair orders turned in by drivers. First, I had them make out order in duplicate—that is, I tried! Now, I make out a duplicate order from the original, the duplicate carrying a serial number for reference. The original card goes to the mechanic doing the work, but the serial numbered duplicate sheet I hold to send in to office with charge slips written by mechanics for parts used on that job. You will note these parts are divided into "Out of Stock No. 4132" and (large parts such as engines and transmissions, etc.) "Out of No. 1185" (warehouse). From this serial numbered copy of the repair order the office posts up and charges to Form C. (The office part of cost distribution is given simply as information to those that may be interested in our complete system of handling repair parts.)

Salvaged parts are handled as exchanges. A rebuilt or new part is supplied in exchange for a worn part turned in by mechanic. If part is too badly worn and has to be scrapped, then the new part is charged against the equipment. In any and either case, the mechanic turns in a Charge Slip covering the part. There are no exceptions to making out Charge Slip which is the only legal tender for parts.

By handling the parts myself, keeping an eye to stock, and with the cooperation of all concerned, I have yet to find this simple method of parts control inventory failing. It is with more than the usual strain on inventory that this simple system functions because of our building Lyon equipment. This means much increase in parts stock in numbers and kinds. With parts what they are today and hard to get on short notice, our parts control has to work. AND IT DOES!

Cold Starting with Immersion Heaters

(Continued from Page 45)

Test Data

FIG. 1—Gives an indication of the rate of temperature drop of various items on the truck in an ambient temperature of —2 deg. Fahr.

FIG. 2—After running the engine it was allowed to cool down with the 750-watt electric immersion heater turned on. The curves of chilling of various parts of the unit follow a definite pattern as indicated, and it is interesting to note that the liquid in the engine block levels out at 45 deg. Fahr. The radiator and crankcase oil also held at a higher temperature than the room.

FIG. 3—Here we have chilling data, holding the room at about —1 deg. Fahr. and noting temperatures throughout the unit with the 500-watt electric immersion heater on. The 500-watt heater held the liquid temperature in the engine block to an average of about 37 deg. Fahr.

FIG. 4—The preliminary work up to this time indicates that it would be not only interesting, but also very pertinent to obtain the heating characteristics of the units where the heater is turned on after the entire truck unit temperature has leveled out to the ambient. Fig. 4 shows the temperatures reached with the 750-watt heater turned on.

FIG. 5—Shows temperatures reached with a total of 1250 watts turned on.

FIG. 6—A point that may be asked at this stage of the test is, assuming that 45 deg. Fahr. is desired in the engine block to obtain a satisfactory engine start, would it be possible to use a high wattage heater and leave it on only long enough to reach the desired temperature? It will be remembered that the 750-watt electric immersion heater leveled out at 45 deg. Fahr. in approximately 7 hours. On the other hand, the 1250-watt heater reached 45 deg. Fahr. in less than 2 hours, and the economics involved here is quite evident. To obtain this information, data is presented in Fig. 6, which shows the temperature rise with a 750-watt plus a 500-watt heater on, and then the 500-watt heater cut out when the block reached 45 deg. Fahr.

Readings were taken every 15 minutes and although we obtained a slight drop in temperature, it indicates that the entire mass, metal, oil and coolant that we are heating readily absorbs the heat and raises temperatures correspondingly. By the same token, it can be deduced that if we hold the high wattage heater on for another 15 minutes, resulting in a few degrees above the temperature desired, that the temperature will be at the point required.

This completes essentially the work done around 0 deg. and subsequent data were obtained holding ambient temperatures at 10, 21 and —15 deg. Fahr.

FIG. 7—Shows a cycle of events resulting from alter-

nate chilling and heating the liquid in the block employing wattage input of 1250, 750 and 500 watts, and obtained with an ambient temperature of around 10 deg. Fahr. The relative rise of the block temperatures with various size heaters is clearly indicated.

FIG. 8—Shows a cycle of events resulting at an ambient temperature of 20 deg. Fahr. The block temperatures have been raised under this condition of 85 deg. and 73 deg. Fahr. for the 1250 and 750-watt units respectively.

FIG. 9—Shows the effect of applying 1250 wattage heat to the liquid in the block, starting from —15 deg. Fahr. It is to be noted that both the crankcase oil and radiator temperatures have been raised about 10 deg. Fahr. by addition of heat to the liquid in the engine block. Although actual data was obtained only on the 1250-watt heater, there is plotted also an estimated heat curve for 1000 and 750-watt units.

FIG. 10—The question could be asked, "What type of results would be obtained with the electric immersion heater with the thermostat removed from the system?" The data on this problem at around 0 deg. Fahr. are shown in Fig. 10, and it is quite apparent that thermosiphoning through the radiator has completely changed the picture.

Fig. 11—An interesting set of curves on the economics involved by using various size heater elements will be found in Fig. 11. Here is plotted kilowatt-hours vs. resultant engine block temperatures for three sizes of heating elements. The kilowatt-hours are based on actual watts consumed, and the efficiency of higher capacity heaters is readily apparent. For example, if it is desired to have a block temperature of 45 deg. with an outside temperature of approximately —2 deg. Fahr., it would take 2.2 and 5.5 kilowatt hours respectively for 1250 and 750-watt capacity heaters.

Analysis of Data

The first attempts to start the vehicle around 0 to —2 deg. Fahr. without heaters were unsuccessful. Two tests using fully charged cold batteries each time failed to provide an engine start. A warm battery was installed with engine conditions practically the same, and a possible start was indicated. Increasing terminal voltage by the use of four and five cells, instead of the original three cells of one battery, provided the necessary cranking effort to effect a start.

It was quite apparent that this truck would be difficult to start around 0 deg. Fahr. and this fact is verified from our field operation, where trouble is encountered in starting the equipment under the conditions given. Where a warm battery is used, higher cranking speeds were obtained, but it must be remembered that the drag resistance must not be so great as to prevent the engine from running under its own power. This point is important, since starts may be indicated by explosions in the exhaust, but this resistance drag is too high to permit the engine to run. Furthermore, where a start is shown as possible, this could be defeated by improper manipulation of controls or variations in engine and battery condition.

Should the opportunity be missed to start, the test revealed that further cranking to effect another opportunity quickly vanishes, since the battery becomes spent, and

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Studebaker salutes America's Laundry Industry

Laundries are making
an annual saving of
380,000,000 truck miles
and 34,000,000 gallons
of gasoline!



THE Office of Defense Transportation has thanked the laundry industry for its "splendid spirit of cooperation" in achieving a 40 per cent reduction in truck mileage.

Studebaker joins with ODT in commending America's laundries for a great job well done.

Before the war, according to the American Institute of Laundering, the laundry industry's 53,000 trucks traveled about 950,000,000 miles annually, yet, last year, in compliance with the national need for conserving trucks, tires and gasoline, the laundries handled 165,000,000 more family bundles than in 1940—and in doing so, saved 380,000,000 truck miles and 34,000,000 gallons of gas.

In giving 12,000,000 U. S. families this extra service, the laundries have made it possible for 1,500,000 women to go into war work and other vital home front activities. And don't forget, the laundries have also been doing 85 per cent of the laundry of the Army Air Forces in addition to 55 per cent of the laundry of the Army Ground Forces.

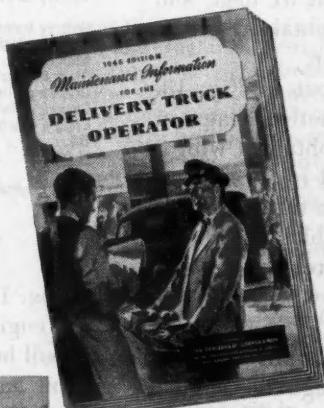
STUDEBAKER
*Pioneer and pacemaker
in Automotive Progress*

BUILDER OF WRIGHT CYCLONE ENGINES FOR THE BOEING FLYING FORTRESS—HEAVY-DUTY STUDEBAKER MILITARY TRUCKS—THE WEASEL PERSONNEL AND CARGO CARRIER

Laundries and other truck operators find Studebaker's handbook helpful

As one of its many continuing wartime public services, Studebaker published a handbook of information on motor truck care last year that was highly praised and widely used by truck operators in many varied lines of business.

In response to popular demand, a new 1945 edition of that handbook is now ready. It contains 48 pages of timely information on how to maintain all makes of motor trucks and improve their performance. You can get a sample copy free from any Studebaker car or truck dealer or by mailing the coupon below.



MAIL THIS COUPON NOW!

Studebaker Truck Division, Dept. CC-21, South Bend 27, Indiana
Please forward free and postpaid sample copy of "Maintenance Information for the Delivery Truck Operator."

Name _____

Firm _____

Address _____

City _____ State _____

Cold Starting With Immersion Heaters

(CONTINUED FROM PAGE 70)

will have to be replaced with another one. This is practically what happens during the starting of truck equipment. The driver runs the battery down and must have it replaced or the truck towed before another starting opportunity is obtained.

As soon as heat was introduced to the engine block, as shown in Fig. 12, an easy start was obtained even with the battery temperature at the ambient room temperature of 0 to -1 deg. Fahr. It is to be noted that by raising a block temperature to 44 deg. Fahr. in two attempts a start was made in 20 seconds. Using a smaller capacity heater where 36 deg. Fahr. was obtained in the block, in six attempts a start was obtained in a little over 1 minute. Since the application of heat to the engine block was also instrumental in raising the crankcase oil temperature, it is reasonable to assume that the oil existing in the main and connecting rod bearings has absorbed some heat which is helpful in promoting easy starting and assisting the lubrication problem.

Having obtained a rather easy start at 0 deg. Fahr. with SAE 20 oil and a block temperature around 36 deg. Fahr., it was decided to repeat the tests at around 0 deg. Fahr. but with SAE 30. With a 750-watt heater raising block temperature top 53 deg., in four attempts a possible start was made in 46 seconds. With a 500-watt heater raising block temperature to 36 deg., the results were negative.

Additional experimental data at around 0 deg. Fahr., is shown in Fig. 13. Here we find that an easy start is obtained with a half charged battery at block temperature of around 63 deg. Fahr. A start was obtained again with SAE 20, with a block temperature at 31 deg., and the battery at 1 deg. Fahr. No start was obtained with a block temperature of around 11 deg. Fahr.

Another interesting point is brought out in Fig. 13. Here we find that using 1250-watt combination heater in the engine block liquid, an easy start is obtained with a cold fully charged battery and SAE 20 oil in the system, whereby this high wattage heater has been turned on for only $1\frac{1}{4}$ hours, resulting in an engine block temperature of around 43 deg. Fahr., after this relatively short heating period.

Data shown in Fig. 4 demonstrated that around 0 deg., with SAE 20 oil in the system and a cold fully charged battery, no start was obtained, even though the engine block liquid was heated to around 11 deg. Fahr. However, where the ambient temperature is around 10 deg. Fahr., a borderline starting condition exists, which indicates an improvement in starting ability, due probably to somewhat higher temperatures in the bearings and throughout the engine. Continuing the work at ambient temperatures around 10 deg., but with SAE 30 oil in the system, we find, for example, that a start is obtained with the engine block temperature raised to around 36 deg. Fahr.

FIG. 12

*F. Room.....	-1	-2	
*F. Crankcase Oil.....	+6	+6	
*F. Block Front.....	44	38	
*F. Block Rear.....	43	34	
*F. Radiator Top.....	+4	-2	
*F. Radiator Bottom.....	+6	+2	
Battery Gravity.....	1.275 @ 1° F.	1.275 @ 4.	
Battery Voltage.....	6.1	6.1	
Cranking Voltage.....	4.2	4.2	
Max. Amps.....	400	400	
Start Attempts.....	2	6	
Cranking Time.....	20.5 Sec.	66 Sec.	
Cranking Revs.....	11	36	
Engine Started.....	Yes	Yes	
Oil.....	SAE 20-20 W	SAE 20-20 W	
Heater.....	750 W	500 W	

FIG. 13

*F. Room.....	-2	-2	-1	-1
*F. Crankcase Oil.....	11	7	0	7
*F. Block Front.....	65	31	12	46
*F. Block Rear.....	62	31	10	40
*F. Radiator Top.....	-2	6	0	0
*F. Radiator Bottom.....	7	6	0	5
Battery Gravity.....	1.265 @ 1° F.	1.295 @ 1° F.	1.305 @ 1° F.	1.290 @ 0° F.
Battery Voltage.....	6.2	6.2	6.1	6.2
Cranking Voltage.....	4.1	4.1	4.2	4.2
Max. Amps.....	350	375	400	400
Start Attempts.....	3	2	4	1
Cranking Time (Sec.).....	30	45	322	9
Cranking Revs.....	12	20.3	80	4.6
Engine Started.....	Yes	Yes	No	Yes
Oil.....	SAE 20	SAE 20	SAE 20	SAE 20
Heater.....	1250 W.	435 W.	287W.	1250 W. for 1.75 Hrs.

† This battery only half charged, yet made a start in 30 seconds.

FIG. 14

*F. Room.....	10	9	9	9
*F. Crankcase Oil.....	11	16	12	11
*F. Block Front.....	13	53	37	9
*F. Block Rear.....	13	52	35	9
*F. Radiator Top.....	10	10	10	9
*F. Radiator Bottom.....	10	13	12	9
Battery Gravity.....	1.280 @ 15° F.	1.300 @ 10° F.	1.290 @ 10° F.	1.285 @ 11° F.
Battery Voltage.....	6.1	6.1	6.1	6.1
Cranking Voltage.....	4.3	4.3	4.2	4.2
Max. Amps.....	400	400	350	400
Start Attempts.....	3	2	1	7
Cranking Time.....	27 Sec.	10 Sec.	11.8 Sec.	112.5 Sec.
Cranking Revs.....	17	6.8	4.8	39.0
Engine Started.....	Borderline	Yes	Yes	Borderline
Oil.....	SAE 20	SAE 20	SAE 30	SAE 30
Heater.....	Off	750	500	Off

FIG. 15

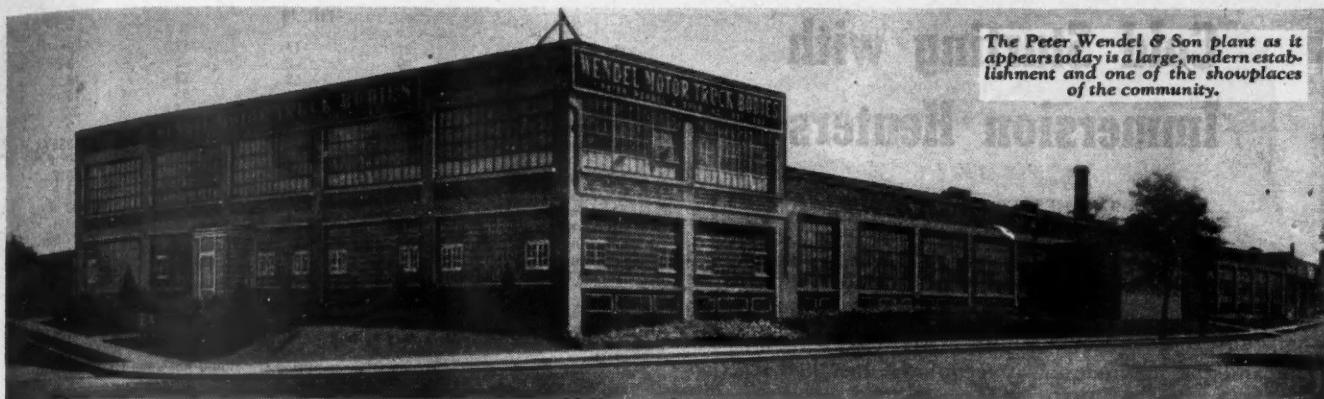
*F. Room.....	9	21	20	21
*F. Crankcase Oil.....	17	32	20	32
*F. Block Front.....	54	85	20	74
*F. Block Rear.....	53	81	21	73
*F. Radiator Top.....	11	34	20	27
*F. Radiator Bottom.....	14	30	20	23
Battery Gravity.....	1.290 @ 11° F.	1.285 @ 21° F.	1.293 @ 21° F.	1.300 @ 22° F.
Battery Voltage.....	6.2	6.1	6.2	6.1
Cranking Voltage.....	4.3	4.3	4.3	5.4
Max. Amps.....	425	350	400	350
Start Attempts.....	1	4	4	
Cranking Time.....	6.5 Sec.	10 Sec.	30.6 Sec.	5 Sec.
Cranking Revs.....	4	8½	Not Taken	4
Engine Started.....	Yes	Yes	Borderline	Yes
Oil.....	SAE 30	SAE 30	SAE 30	SAE 30
Heater.....	750 W.	250 W.	750 W.	

† Engine fired but did not develop power to keep going.

Fig. 15 indicates a start obtained in 6.5 seconds where the engine block has been elevated to 53-54 deg. Fahr. It will be recalled that with SAE 30 in the system, an ambient temperature of sound 0 deg., the battery temperature around zero and a block temperature of 36 deg., no start was obtained, and yet at approximately the same block temperature with the same oil and the ambient temperature at around 10 deg., battery at 10 deg., a start is indicated.

Continued work with SAE 30 oil in the system at ambient temperatures around 20 deg. Fahr., data in Fig. 15 indicate that a borderline starting condition exists without any heat to the block at this temperature.

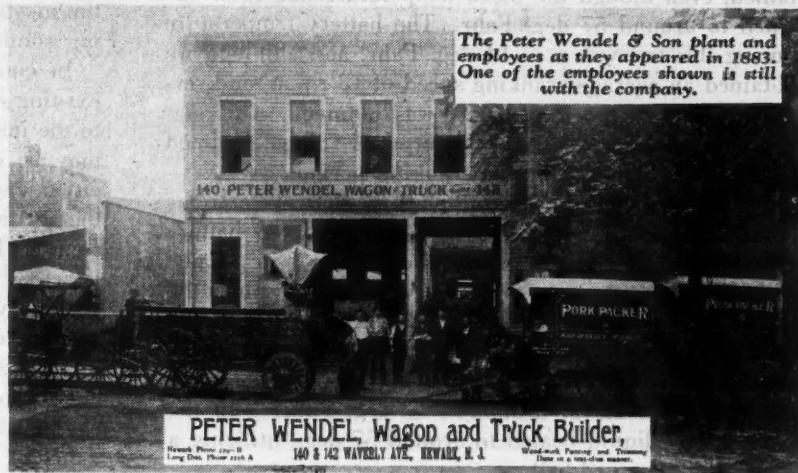
(TURN TO PAGE 74, PLEASE)



The Peter Wendel & Son plant as it appears today is a large, modern establishment and one of the showplaces of the community.



Daniel C. Wendel,
present head of
Peter Wendel &
Son, Inc.



The Peter Wendel & Son plant and employees as they appeared in 1883. One of the employees shown is still with the company.

WAGON BUILDER IN 1883 . . .

Ls "Jim" Today

PETER WENDEL & SON, IRVINGTON, NEW JERSEY, HAS 62-YEAR HISTORY OF SUCCESSFUL BODY BUILDING

Peter Wendel & Son, Inc., Irvington, New Jersey, was established in 1883—as a wagon building and repairing plant. In the 62 years since, the business has kept abreast of every change. Now an Ls representative, the corporation employs 110 people, owns nine acres of land, and operates a plant with 70,000 square feet of floor space.

Typical of Ls dealers in their efficient handling of customers' needs, Peter Wendel & Son, Inc., offers individualized service combined with all the advantages of mass production. Lindsay Structure bodies of light-weight steel and aluminum are assembled to exact specifications, with quick delivery assured. Interchangeable parts for Ls spell fast repairs, and owners of national fleets can have Ls bodies built or repaired by any of the 92 Ls dealers over the country.

Check the many other advantages of Lindsay Structure with your Ls "Jim" today. Lindsay and Lindsay, Adams-Franklin Building, Chicago 6, Ill.; 60 E. 42nd St., New York 17, N. Y.; or Lindsay Structure (Canada) Ltd., Dominion Square Bldg., Montreal.

LINDSAY STRUCTURE



U. S. Patents 2017629, 2263510, 2263511
U. S. and Foreign Patents and Patents Pending

DISTRIBUTORS AND DEALERS THROUGHOUT THE COUNTRY

Cold Starting with Immersion Heaters

(CONTINUED FROM PAGE 72)

In Fig. 16 will be found starting test data with outside temperatures around -17 deg. Fahr. At around -17 deg. Fahr. ambient temperatures, SAE 20 oil in the system, and the maximum wattage of the installed electric heater on, namely 1250 rated watts, no start was obtained, even though the block temperature had been elevated to around 57 deg. Fahr. The battery temperature during this test was at -14 deg. Fahr. and although we obtained an average cranking speed of 18 r.p.m. and several explosions noted, no start was obtained. One significant factor here was that the terminal voltage dropped to below 4.0 volts during the cranking period.

In order to start the engine at this relatively extreme temperature condition, we found that another battery (which was at a temperature of 68 deg. Fahr.) in parallel with the cold battery on the truck was helpful. Since the cold battery in question had been pretty well run down by the previous test, it is probable that it aided very little to the starting effort, so that it might be concluded that a start is possible at around -17 deg. Fahr. with the engine block liquid heated to around 57 deg., utilizing a warm, fully charged battery.

The importance of the thermostat on this problem is also shown in Fig. 16. For this test, the thermostat was removed and with the 750-watt immersion heater on, we only reached around 15-16 deg. Fahr. in the engine block as against 45 deg. with the same capacity heater and the

	21	-17	-17	0
*F. Room	21	-17	-17	0
*F. Crankcase Oil	29	-2	-2	3
*F. Block Front	58	58	58	16
*F. Block Rear	58	55	55	15
*F. Radiator Top	23	6	6	22
*F. Radiator Bottom	27	8	8	2
Battery Gravity	1.295 @ 21° F.	1.300 @ -14° F.	1.285 @ 68° F.	1.385 @ 0° F.
Battery Voltage	6.2	6.2	6.1	6.2
Cranking Voltage	4.4	3.0-4.0	4.0-4.7	4.3
Max. Amps.	400	375	450	400
Start Attempts	1	4	3	2
Cranking Time	4.5 Sec.	112 Sec.	56 Sec.	27 Sec.
Cranking Revs.	3	34	29	10
Engine Started	Yes	No	Yes	Possible
Oil	SAE 30	SAE 20	SAE 20	SAE 20
Heater	500 W.	1250 W.	1250 W.	750 W.

* In parallel with cold battery used in previous test. Voltage sufficient to give ignition start.

* Gave indication of starting at second attempt. Could not keep running. Thermostat out.

thermostat in place. As was expected, a borderline starting condition resulted at this temperature.

In conclusion it might be well to mention that some existing engine blocks do not lend themselves too readily to the installation of standard immersion heaters. Others may be more adaptable to such an installation, but in either case consideration should be given to supporting the heating elements to reduce the probability of vibration failure. It certainly would appear to be much more satisfactory if provision for installation were originally designed by the engine manufacturer.

The data presented in this report does indicate the improvement in starting ability resulting from the introduction of heat through the means of immersion heaters. On the other hand, there are, no doubt, other methods than the one mentioned here for accomplishing these results.

Perhaps for postwar applications some thinking along these lines would not be amiss at this time.

END

(Please resume your reading on P. 46)

New Ford Breather Caps Eliminates Service Problem

Substitution of a combination of aluminum alloy wire crimp in engine oil breather caps has eliminated a service problem on Ford buses and trucks.

Prime advantage of the aluminum alloy crimp is that it does not promote varnish. Heavy varnish deposits on oil breather packing accumulate rapidly on buses and trucks because of their higher operating temperatures. Thus servicing is made more difficult, due to cap sticking, while excessive oil consumption may result from increased internal pressure forcing the oil past the rings or retainers.

DeVilbiss Spray Painting School Announces Classes

Two one-week classes will be held for automotive refinishers in the School of Spray Painting to be con-

ducted by The DeVilbiss Co., Toledo, Ohio. Sessions starting Feb. 12 and May 14, will be open to all regular users of DeVilbiss spray painting equipment.

4,744,000 Trucks Operating On Home Front

The truck manufacturing industry of the United States is now producing military vehicles and parts at the rate of two and a half billion dollars a year, or two and a half times the total value of all trucks and parts manufactured in 1941, the peak peacetime production year, according to the 1944 edition of Motor Truck Facts, a publication of Automobile Mfg. Assn. Of these purely military vehicles, 38 per cent have been shipped to Allied nations under lend-lease or direct purchase.

Since the beginning of the war more than 2,240,000 motor trucks have been produced for the Army and

the Navy. Of this total 877,000 are light trucks under 9000 lb. g.v.w.; 578,000 are medium size, 9000 to 16,000 lb.; and 785,000 are over 16,000 lb. g.v.w.

As to performance of motorized highway carriers on the domestic front, the booklet points to the 4,744,000 trucks and 216,000 trailers which were operating under certificates of war necessity on June 30, 1944, and adds that this total was "only slightly below all-time peak."

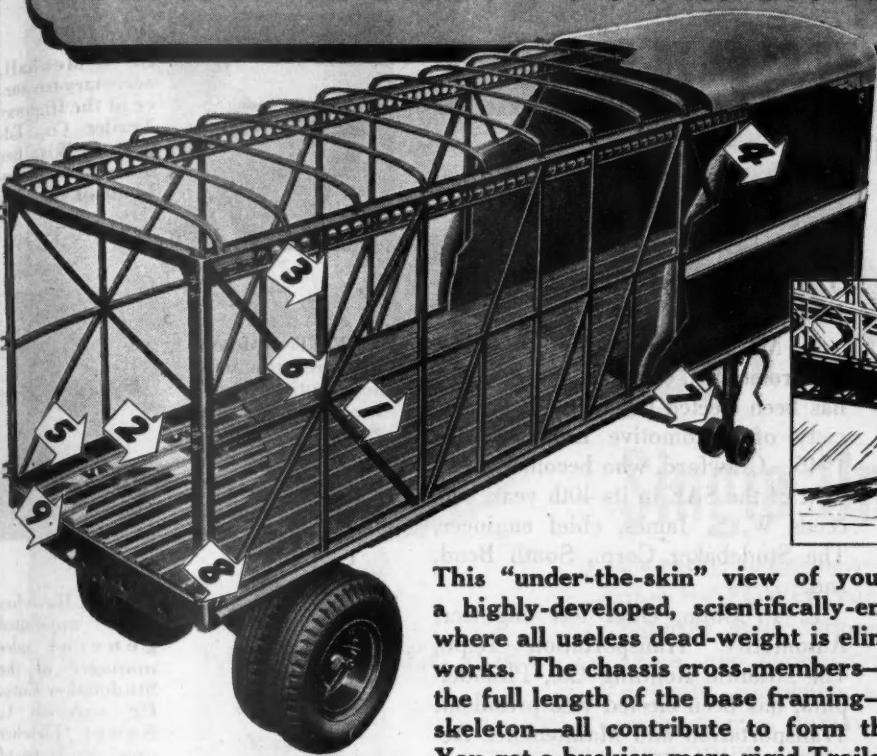
"Farmers use 34 per cent of all motor trucks and hold 47 per cent of all truck certificates of war necessity issued by ODT," and "98 per cent of farm products leaving farms move by truck."

Studies made by several state agricultural colleges in the mid-west reveal that small business firms utilize trucks in hauling nearly half their inbound and outbound shipments.

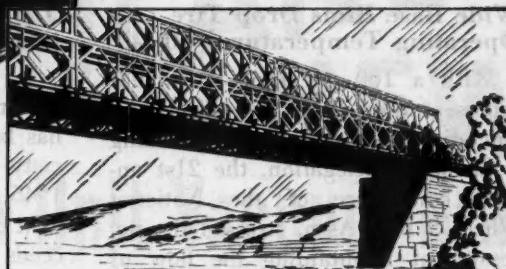
Forty-nine large cities receive all their milk by motor truck.

Built like a Bridge!

EVERY POUND OF STEEL CONTRIBUTES TO SUPPORT AND PROTECT THE LOAD! No Useless Dead-Weight!



An artist's copy of the type of bridge construction used by the Army engineers to carry heavy equipment. Compare the almost identical framing of a Fruehauf Integral-Frame Aerovan with this efficient weight-carrying structure.



This "under-the-skin" view of your 1945 Fruehauf Trailer reveals a highly-developed, scientifically-engineered product—a unit-design where all useless dead-weight is eliminated and every pound of metal works. The chassis cross-members—the steel ribs running practically the full length of the base framing—the patented steel-tubular upper skeleton—all contribute to form the sturdy, rugged unit-structure. You get a huskier, more rigid Trailer—without excess weight—hence your Fruehauf will carry more payload longer and at lower cost.

1 Patented Steel-Ribbed Floor—1000-lb. concentrated load capacity per sq. ft.—2½ times greater than an all-oak floor of the same thickness. Individual boards easily replaced.

2 Ten High-Tensile Steel Ribs—Welded to every cross-member—tremendously increase strength and durability of the whole structure. Provide full-length support for floor boards.

3 Upper Framing—Built like a bridge. Welded, rectangular, tubular, high-tensile steel sections provide equal strength as a column, strut or tie. The result—a husky skeleton, yet without useless weight. Easily repaired in the event of accident.

4 Unstressed Panels—Fruehauf zinc-coated (corrosion and rust-proofed) steel panels serve only as a covering. They are not part of the supporting structure. Should they be damaged—or even removed—the vehicle is not weakened in any respect.

5 Frame Cross-Members—Die-formed of high-tensile steel. Stress factors are scientifically computed and

all non-load carrying metal is punched out in accordance with the aircraft principle.

6 Complete Welded Unit—Forms entire integral-frame Aerovan into a solid, durable, one-piece unit.

7 Wide Vertical Supports—Eliminate nose-diving. Mounted under outer sides of frame—provide maximum strength and stability. 2-Speed gear ratio.

8 Spring Hangers—mounted vertically, directly under the load-carrying frame members—a great improvement over the old "offset" method. The result—twisting stresses eliminated, road stability gained.

9 Extra Strength—At points of greatest stress, extra support is provided by additional, wider, deeper cross members. At Upper 5th Wheel maximum rigidity is secured by steel channel box-sections.

★ ★ ★ ★ ★

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY ◆ DETROIT

Service in Principal Cities

FRUEHAUF TRAILERS

"ENGINEERED
TRANSPORTATION"
REG. U. S. PAT. OFF.



CCJ NEWSCAST

Wide Base Rims Drop Tire Operating Temperatures 60%

With a 100 per cent attendance representation from 53 wheel and rim distributor members, including a Canadian delegation, the 21st annual conference of the National Wheel & Rim Assn. stressed the necessity of maintaining the flow of replacement equipment in order to keep in operation the essential vehicles on the home front.

Reviewing the benefits of the wide base, the conference outlined how mountings determined on a ratio of 70 per cent rim width to tire width can possibly increase tire mileage from 20 per cent to 50 per cent. This is brought about by permitting the tire, after mounting, to retain its natural shape, by elimination of excessive rounding of tread and sidewalls, by preventing the pinching in of beads. Mounted on a wide base, it was stated, the tire has more air volume directly under the load, keeps the full tread in road contact and, because of less friction, often brings tire operating temperatures down as much as 50 to 60 deg.

H. M. Young of Borbein, Young & Co., St. Louis, Mo., was re-elected president; John F. Creamer, of Wheels, Inc., New York, N. Y., re-elected vice president, and F. W. Dennerline, of Indiana Wheel & Rim Co., Indianapolis, Ind., re-elected treasurer.

United Motors Now a Division of General Motors

United Motors Service, formerly operated as a wholly-owned subsidiary of General Motors, on December 31 became a division of the corporation.

J. M. Crawford Elected SAE President for 1945

J. M. Crawford, chief engineer, Chevrolet Div., General Motors Corp., has been elected president of the Society of Automotive Engineers for 1945. Crawford, who becomes president of the SAE in its 40th year, succeeds W. S. James, chief engineer, The Studebaker Corp., South Bend, Ind.

E. P. Gohn, chief test engineer, Automotive Transportation Dept., The Atlantic Refining Co., Philadelphia, has been elected vice president, Transportation and Maintenance Activity; H. A. Flogaus, engineering vice president, J. G. Brill Co., Philadelphia, vice president of the Truck and Bus Activity; B. B. Bachman, engineering vice president, The Autocar Co., Ardmore, Pa., has been re-elected treasurer.

Pacific Car & Foundry Acquires Kenworth Truck

Announcement has been made by Paul Pigott, president of the Pacific Car and Foundry Company, of Seattle and Renton, Wash., that the company has acquired controlling interest in the Kenworth Motor Truck Corp., of Seattle.

The new officers of Kenworth are Paul Pigott, president; Ferdinand Schmitz, vice-president; John Holmstrom, vice-president & general manager; Vernon Smith, vice-president; John Cannon, secretary-treasurer (on leave); K. T. Worthington, assistant secretary-treasurer; F. D. Pitts, assistant secretary-treasurer.

No changes are planned for the duration in the operation of Kenworth since both organizations will

(TURN TO PAGE 78, PLEASE)

J. E. Savacool, vice president and comptroller of Mack Trucks, Inc., has been named a member of the board of directors



E. A. Menhall, secretary-treasurer of the Highway Trailer Co., Edgerton, Wis., has been elected president of the company



J. T. Templeton becomes the new automotive director of sales at the Sparks - Withington Co., Jackson, Mich.



Paul R. Davis has been appointed general sales manager of the Studebaker Corp. He succeeds C. Scott Fletcher now on leave of absence



John Barclay will direct sales for the Heil Co., in the newly established Northwest District Offices at Seattle

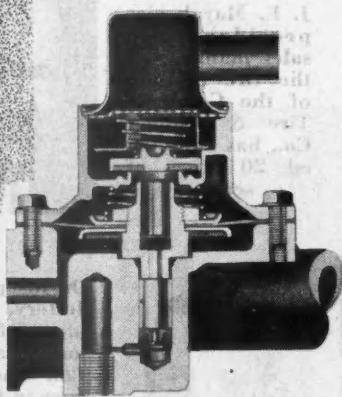


Clyde Brayton, left, president of the Red Arrow Freight Lines Inc., Houston, Tex., accepts the Trailmobile Safety Trophy from Joseph F. Meyer of the Houston-Harris County Safety Assn.

HY-POWER
THE
MIDLAND
STEEL PRODUCTS CO.
CLEVELAND, O. - DETROIT, MICH.
PATENTS PENDING PAZ. 2,219,062 10-22-40

MIDLAND'S NEW Single Unit Vacuum Brake

"PATENTS MAKE JOBS"



Sectional View of
Hydraulic Valve

Simplicity, ruggedness and greater efficiency distinguish Midland's new HY-POWER vacuum brake. What formerly were three separate units—vacuum diaphragm chamber—hydraulic vacuum valve, and hydraulic slave cylinder—are now incorporated into a single, completely enclosed device. HY-POWER design eliminates special valves, levers and all outside moving mechanism. HY-POWER needs no lubrication.

This simplified unit brings installation and service to a minimum. HY-POWER can be mounted at any available place on the chassis. No standard chassis unit need be moved.

Long, trouble-free service and maximum efficiency are guaranteed by the fact that the HY-POWER unit is sealed against mud, water, dust, dirt, rust or corrosion.

See your Midland distributor, or write to us for complete information about this sensational new braking unit.

THE MIDLAND STEEL PRODUCTS CO.
10605 MADISON AVE. • CLEVELAND 1, OHIO

Export Department: 38 Pearl Street, New York City

MIDLAND POWER BRAKES

CCJ NEWSCAST

(CONTINUED FROM PAGE 76)

devote their efforts exclusively to fulfilling their respective war orders.

The Pacific Car and Foundry Co., one of the largest industrial plants in the Pacific Northwest, with general offices in Renton, operates a modern up-to-date steel foundry, a structural steel plant, forge shop, large machine shops, galvanizing plant, motor coach division, wing spar division and other facilities. At Renton are manufactured in normal times winches, yarders and other logging equipment; railway, mine and logging cars; structural steel products of all types; city and school bus bodies and other machinery; alloy steel and special steel castings.

The Kenworth Motor Truck Corp., of Seattle, is a nationally known manufacturer of heavy-duty trucks and bus chassis. Since the outbreak of the war its facilities have been devoted primarily to war production.

Under the new relationship the combined organizations and their facilities will be devoted after the war to the developing of highway and city passenger carrying motor coaches, logging trucks, oil company vehicles, heavy-duty contractors' trucks and highway transport vehicles for the special requirements of mountain driving and heavy hauling.

Million Trucks Will be Delivered Within Year After V-E Day

A market estimated at around four million trucks, the greatest in the history of the industry, awaits postwar dealers, according to Carl Loud, sales manager of the Federal Motor Truck Co.

Loud predicted that this unparalleled market would be open to truck dealers because within two years after the war in Europe is over, practically all of the 4,200,000 trucks estimated to be running on our highways will be five years old or over, and a substantial share of these units ready for replacement.

With reconversion from military to civilian production not as serious as that now apparently facing passenger car manufacturers, he said the truck industry as a whole would be in a position to produce probably one million trucks within a year after pres-

ent hostilities cease, and possibly a total of three million units within a two-year period thereafter.

As an example Loud pointed out that Federal had raised its production capacity several times over pre-war levels and that when civilian truck production is again resumed on an unrestricted basis, Federal would be able to meet the expected postwar market for truck units with greatly increased production facilities.

Loud also declared he believed that present restrictions upon the manufacture and sale of trucks would be relaxed considerably after victory in Europe. When this time arrives there will undoubtedly be a sudden increase in the production of trucks for civilian use.

1944 Monthly Production of Trucks and Truck Tractors*

1944	LIGHT Under 9000 lb. G.V.W.		
	Civilian	Military	Total
January	21,479	21,479	
February	21,095	21,095	
March	21,081	21,081	
April	19,481	19,481	
May	19,338	19,338	
June	20,030	20,830	
July	20,269	20,269	
August	23,441	23,441	
September	21,367	21,367	
October	18,534	18,534	
November	19,785	19,785	
Total—11 Months	226,680	226,680	

	MEDIUM 9000 to 15,000 lb. G.V.W.		
	Civilian	Military	Total
January	1,985	12,806	14,791
February	1,796	9,940	11,738
March	3,317	8,303	11,620
April	6,245	6,649	12,894
May	7,310	7,007	14,317
June	9,319	6,625	15,944
July	8,582	6,031	14,613
August	10,246	5,748	15,994
September	10,034	6,300	16,334
October	9,432	6,144	15,576
November	10,153	6,503	16,656
Total—11 Months	78,423	82,064	160,477

	HEAVY 16,000 lb. and over, G.V.W.		
	Civilian	Military	Total
January	543	21,783	22,326
February	988	21,870	22,858
March	1,311	22,347	23,658
April	1,906	21,438	23,344
May	1,988	21,277	23,265
June	2,607	21,805	24,412
July	2,881	23,987	26,858
August	2,283	26,847	29,110
September	2,243	25,098	27,341
October	3,643	26,376	30,019
November	4,525	28,059	32,584
Total—11 Months	24,658	260,897	285,555

TOTAL—ALL WEIGHTS		
January	Civilian	Military
February	52,528	56,068
March	2,766	52,905
April	4,828	51,731
May	8,151	47,568
June	9,298	47,822
July	11,926	49,260
August	11,243	50,297
September	12,511	56,034
October	12,277	52,785
November	13,075	51,054
Total—11 Months	14,678	54,327
	102,081	569,631
		672,712

*Automotive Division, WPB Data include jeeps, military ambulances and wheel-drive personnel carriers; half-tracks and armored cars are excluded.

Childress Named President of Trailmobile Co.

Wade Childress, formerly of St. Louis, has been named president of The Trailmobile Co., Cincinnati, Ohio. He served as regional manager for the WPB at Kansas City and later became director of field services for WPB at Washington. Since October Childress has guided the administrative operations of Trailmobile, although his election as president was not effective till the turn of the year.

He also is president of the Columbia Terminal Co., midwestern transportation company which controls Trailmobile.

Carriers' Revenues Drop and Expenses Jump in November

Expenses of motor carriers of property in November amounted to 98.1 cents for each dollar of gross revenue, according to data compiled by the Research Department of American Trucking Assn., Inc.

Based on reports from 227 motor carriers in 39 States, the study showed November revenues decreased 4.4

(TURN TO PAGE 240, PLEASE)

J. E. Mayal, vice president and sales manager of the tire division of the Goodyear Tire & Rubber Co., has completed 20 years of service



Dr. Joseph Arthur Jeffery, vice president of Champion Spark Plug Co., and a pioneer in the development of spark plugs, died December 26 in Detroit. Dr. Jeffery, 71, was active as general manager of Champion's ceramic division at Detroit



Charles A. Cook, formerly chief engineer at Fuller Mfg. Co., has been appointed assistant chief engineer of Timken-Detroit's Wisconsin Axle Division. He will have charge of transmission development for postwar commercial vehicles

Three-tenths of 1¢ a mile is the maintenance cost for each of the Macks pictured below. That means a whole lot when you figure that each of these tough trucks has covered more than 250,000 hard, punishing miles during the past four and a half years. Their owners, the Capitol

Trucking Company of Fords, New Jersey, look forward to plenty more rugged, economical miles.

Mack trucks everywhere are doing a whale of a job and making records like that . . . records that speak for Mack's extra strength and reliability on the job . . . records that mean real money-making operations.

Again and again, Mack trucks make these records and prove that "You can't beat a Mack!"



Performance Counts!...



Mack Trucks, Inc., Empire State Bldg., New York City. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

Mack

TRUCKS

FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS



BUY U. S. WAR BONDS

Postwar & Post Postwar

Motor Truck Design

Immediate postwar trucks will resemble '42s; later models will feature better engines, major functional improvements

by FRED B. LAUTZENHISER



Fred B. Lautzenhiser

THERE is much speculation by the general public as to what will be incorporated into the design and construction of the postwar truck.

Advertisements, trade journals and newspapers have illustrated artists' conceptions of what postwar trucks will look like. Some of these have real merit while others are but flights of fancy and look like a Jules Verne dream or a Buck Rogers rocket car.

Generally speaking, however, and for some time to come, the immediate postwar truck of most makes will very likely continue to look pretty much like and incorporate pretty much the same specifications as the WPB authorized current production vehicles which are yet basically the 1942 models. Many makes and models will no doubt embody certain improvements and refinements that have resulted from wartime experience. However, it is not likely that the immediate postwar truck will incorporate new design, construction or materials radically departing from those of 1942.

Why won't the immediate postwar

truck embody the last word in new design? Because of that factor called "lead time." When the war hit us our motor truck designing engineers had to drop their normal activities and have since devoted their full time to the design and development of military equipment, half tracks, tanks, jeeps, peeps and creeps, guns, shells, military vehicles and thousands of other items entirely foreign to their normal activities and to that of their plants. Not until after victory in Germany can they again concentrate on trucks.

A truck can't be designed over night. Nor can it be developed and built in another night. Nor can it be tested the third night. It takes months and months to bring through a new model from the inception on the drawing board to the payload on the highway. When the new models do come, they will be post postwar trucks.

The Post Postwar Truck

It is probably safe to predict in a general way that the post postwar truck will also resemble the '42 models in chassis layout and in general appearance with probably a trend in the heavier models toward the elimination of the passenger car

type of gingerbread and beauty treatment of the past. Light delivery vehicles that are constantly in the public eye, will continue to be dolled up and many new vocationally-designed special-purpose bodies will enter the picture. A great many of the heavier trucks of the past too frequently were designed to carry a given load with the hope that they would fit the job or that the job could be fitted to the truck. The design of post postwar vehicle will bear more evidence of serious thought based on past experience for its vocational objective in the selection and coordination of its various components and major units.

Trucks for on-highway use of 18 to 20,000 lb. g.v.w. rating and upward to the maximum that state laws will permit, through the generous use of aluminum and other light materials, will be lighter but stronger and more durable than the '42 models, thus increasing payloads, decreasing operation costs and minimizing time formerly lost during repair.

There will be both the conventional design (with engines out in front) and the c.o.e. (cab forward, stub nose or engine-under-seat) in the post postwar truck lines. The c.o.e. type, however, will not be an alteration or conversion of the conventional, but will be a basic design itself.

Better load distribution will be attained by improved relation of axles to loading space, providing increased payload, better balance, conserving rubber and avoiding excessive maintenance expense.

In the past, it was common practice with some manufacturers to create a truck-tractor out of a standard truck simply by shortening the wheelbase. The post postwar tractor will be designed especially for the purpose of coordination with semi-trailers through provision of ample power, proper relation of gear reductions to the engine power curve, special springs and proper load distribution permitting fifth wheels to be mounted in a more or less uniform location with respect to the tractor rear axle.

The Power Plant

The trend will be definitely toward higher compression engines and toward a higher ratio of engine horsepower to gross vehicle weight, resulting in far better performance than

(TURN TO PAGE 148, PLEASE)

now HYDROVAC production GROWS the 1,000,000 mark

PREFERRED because it's simpler, better protected, easier to service.

PREFERRED because it makes driving easier, gives toe-touch braking.

PREFERRED because it's the best-proved new product ever offered the industry.

the swing's to

Hydrovac by Bendix!

(HYDRAULIC-VACUUM POWER BRAKING)

BENDIX AND HYDROVAC ARE TRADE-MARKS
OF BENDIX AVIATION CORPORATION

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FEBRUARY, 1945

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81

CCJ QUIZ

by ROBERT F. BAHL

Correct Answers on Page 128

Do you know enough about diesel engines on trucks to score a passing mark on this CCJ Quiz? Passing grade is 60 out of a possible 100, but you should be able to do better than that. Each question is worth 10 points. Answers are on page 128.

1.

About what time did diesel-engine trucks first make their appearance in the United States?

- a. 1897
- b. 1917
- c. 1925
- d. 1933

2.

If you had operated an early diesel-engine truck, one of your chief complaints would have been . . .

- a. The high tax on diesel fuel
- b. The cloud of black exhaust smoke which followed the truck
- c. Inefficiency at low speeds
- d. Difficulty and danger involved in hand cranking

3.

In a question of "Diesel vs. Gasoline," which of these would you say were advantages of the diesel engine and which would favor the gasoline engine?

- a. Initial cost of engine
- b. Cost of fuel
- c. Lightness in weight
- d. Efficiency in developing horsepower
- e. Flexibility under varying operating conditions

4.

Your 10 credits for this question are divided into five parts. Tell whether each of these questions is true or false, and add two points to your score if you choose correctly.

a. Dr. Rudolph Diesel, inventor of the diesel engine, was a German submarine commander in World War I. True? False?

b. Like many inventors, Dr. Diesel reaped no financial benefits from his invention. True? False?

c. Dr. Diesel became an American citizen after the first World War. True? False?

d. Dr. Diesel was a student of the famous von Linde, the first man to liquefy air. True? False?

e. Dr. Diesel is living today. True? False?

5.

Here's another set of "True or False" statements. Again, you get two points for each correct choice.

a. The diesel engine is a high compression internal combustion engine. True? False?

b. The efficiency of the diesel engine drops off with a decrease in power output. True? False?

c. All diesel engines used on trucks are of the four-cycle type. True? False?

d. Supercharging on diesel engines has enabled an increase of about 30 per cent in horsepower with no appreciable increase in size or weight. True? False?

e. There are more diesel-powered

buses operating in this country than diesel trucks. True? False?

6.

Diesel engine trucks might still be considered in their infancy, which leads to our asking which section of this country has largely been the "cradle" of developments and improvements in diesel engines.

- a. The West Coast
- b. The Mid-West
- c. New England
- d. The South

7.

You could search a long time and never find one . . . or several . . . of these on a diesel engine. Which?

- a. Carburetor
- b. Crankshaft
- c. Pistons
- d. Valve mechanism
- e. Electric ignition system
- f. Spark plugs

8.

The temperature of the air inside a diesel cylinder at the extreme point of compression is equal to that of . . .

- a. Live steam
- b. Boiling water
- c. Red hot iron
- d. Dry ice

9.

Fuel oil is forced into the cylinders of a diesel engine at pressures from 3000 to 20,000 lbs. per sq. in. A pressure of 20,000 lbs. is equivalent to the pressure of the sea at a depth of . . .

- a. 100 ft.
- b. 1000 ft.
- c. 1 mile
- d. 9 miles

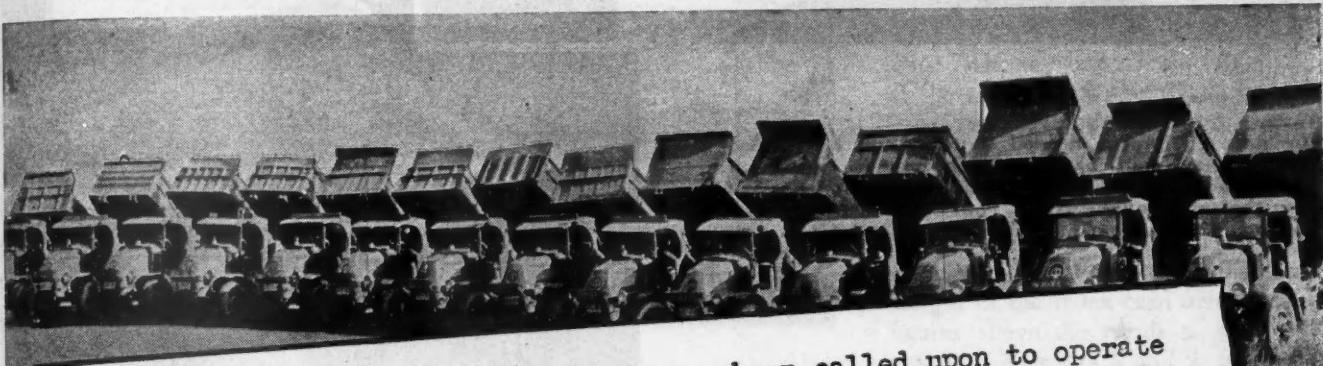
10.

Make two columns. Head one "Gasoline Engine" and the other "Diesel Engine." Then put these various attributes in the correct column. You score one point each time you pick the right column.

- a. Compression of mixture of air and fuel
- b. Compression of air only
- c. Carburetor
- d. Electric ignition
- e. Compression ignition
- f. Fuel injector
- g. Compression ratio of 6 to 1
- h. Compression ratio of 16 to 1
- i. Varying temperatures within the cylinder
- j. Uniform temperatures within the cylinder

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VALVOLINE Plus-Protection



During the present war emergency I have been called upon to operate my trucks on very heavy schedules, day and night, for the Army and Navy in location camp construction work. We have operated in all kinds of weather, extreme heat and extreme cold, in hot dusty fields and fills, and in swampy lowlands -- and it has been a source of keen satisfaction to me to know that Valvoline has been on the job in my trucks.

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Rocco Brothers, Owners
Tri-Rocco Company
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In his fleet of 20 hard-working 1930 and 1931 AC Mack Heavy Duty dump trucks, Mr. Rocco has found through a number of years of satisfactory performance that Valvoline gives him the dependable extra protection demanded by extraordinarily tough wartime working schedules.

Whether your own fleet is large or small, Valvoline motor oils and lubricants and Valvoline Fleet Laboratory Service can extend the useful life of your equipment, eliminate a lot of operating headaches, and consistently save you money. Write your nearest Valvoline office today!

COSTS MORE TO MAKE — COSTS LESS TO USE

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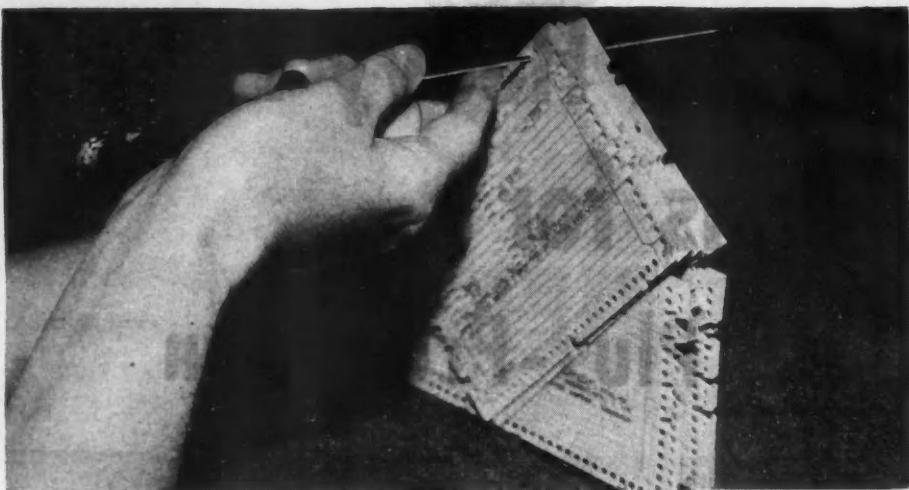
The 1st Pennsylvania Oil

VALVOLINE OIL COMPANY

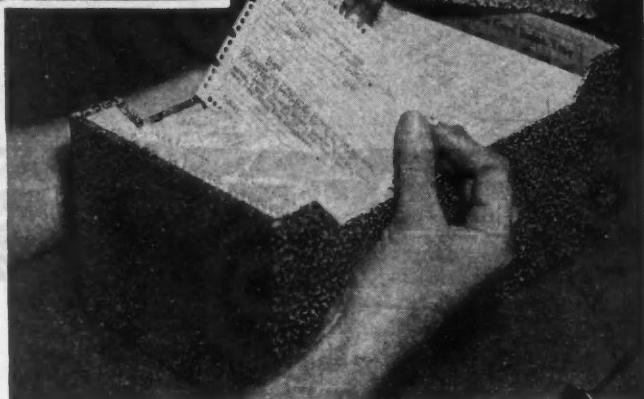
588 EAST FIFTH STREET CINCINNATI 2, OHIO

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REFINERY IN PENNSYLVANIA



The only equipment needed in this hand key punch system is a small bayonet or hatpin for insertion through holes of index cards to lift out unwanted cards from the cards sought. Right, code numbers and letters covering 40 points are listed inside cover of key tray



Fleet Finds Facts Quickly With Key-Punched Records

Simple system permits instantaneous inventory of as many as 40 items of equipment, and a rapid analysis of traffic accidents

by R. KING

THE other day R. G. Booth, assistant to T. H. Mullen, engineer of transportation in the Los Angeles Department of Water and Power, Power System, answered the telephone and heard this request from another department:

"How many trucks do you have, of more than 5-ton capacity, with

flat bed bodies of 20 ft. or more?"

Since the department fleet comprises 555 trucks, one naturally might expect that getting such information would be a matter of hours. Actually, it took Booth less than 60 seconds.

He merely reached for a 4x6x11-in. box which looked like an ordinary

card index, extracted a handful of cards out of the 555, inserted a hatpin like bayonet through some holes punched around the edges and let some cards slip through his fingers to the desk. He repeated the operation a few times, counted the three cards that had slipped through the bayonet down to the desk, and spoke into the telephone.

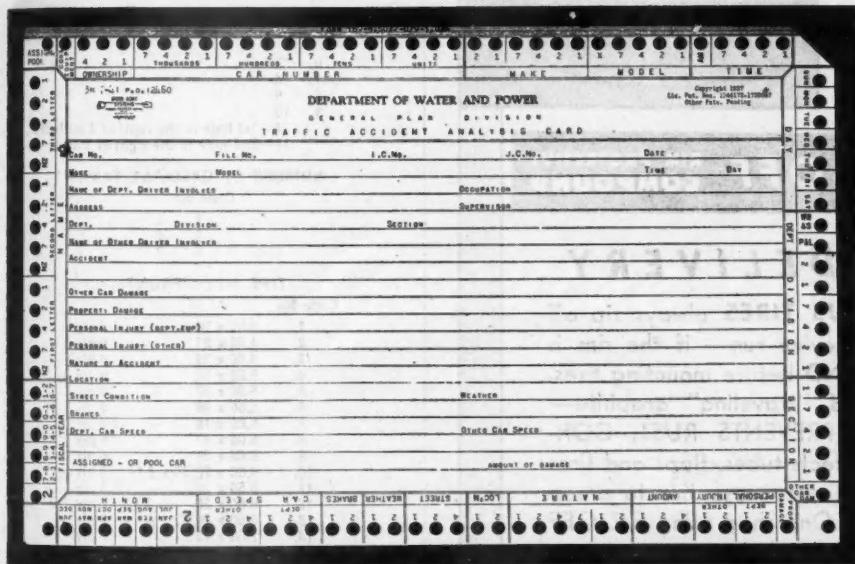
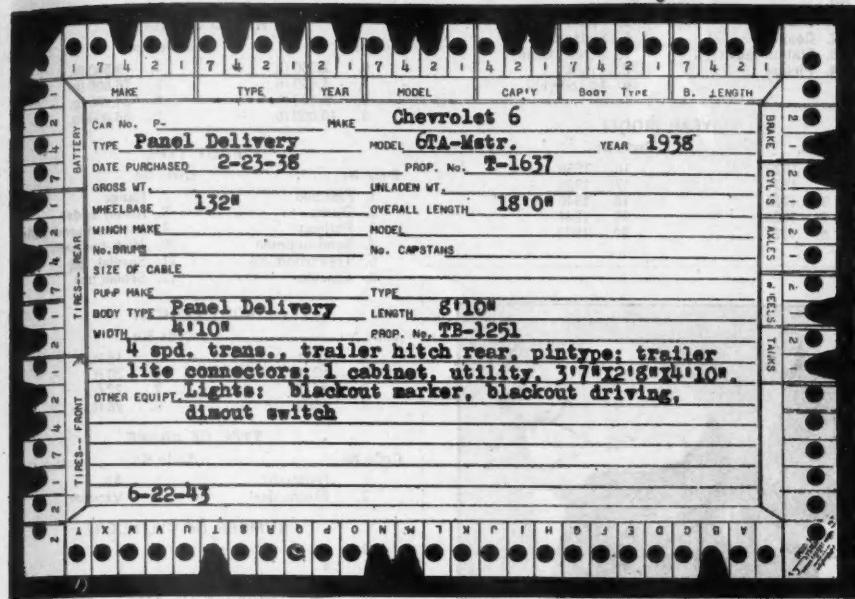
"We have three trucks in that category," he replied.

Once, getting information like that meant hours of leafing through the five loose-leaf index books containing details of fleet equipment. Now, virtually the same material is filed in the small index box that lies on one end of the desk. What makes it different, though, is that this is not just an ordinary card index. Actually, it is a key-punch system, devised along the same principles as the machine-worked key-punch systems in use by large corporations, but hand-operated. It requires no machinery and

(TURN TO PAGE 87, PLEASE)

Fleet Finds Facts Quickly . . .

(Continued from Page 84)



Above, an actual card from the key punch index. Note the notches in punched margin for separating cards when inserting the bayonet. Below is a typical 4 x 6 in. card for traffic accident analysis. It has not yet been coded

no specially trained operators. Any-one can find the desired information from these cards after a five-minute explanation.

Details of the system were worked out by Booth, after some thought and experimentation, and passed on to a concern which manufactures such material.

At first Booth tried 3x5-in. cards, but these proved too small, so 4x6 in. were ordered. One card is sufficient for complete information about each truck. It provides for information on 40 points of equipment.

On the face of each card are lines on which may be typed information such as the vehicle's number, make,

model, gross wt., wheelbase, overall length, and so on, as shown in Fig. 1. Some of this information and many additional points are compactly indexed in code numbers and letters around the four edges of each card. A key to these code numbers and letters is conveniently placed inside the cover of the filing tray. The cards are arranged in the file numerically.

Here is how code numbers are read: First, notice that at the top edge of the card, above the words TYPE, BODY TYPE and BODY LENGTH, there are numerals 7, 4, 2, 1. Of these four numbers, singly or in combination, it is possible to make up numbers from 1 to 14 inclusive. For example, the number 6 is not shown on the top margin of the index card among the figures above the words B. (Body) LENGTH. Numbers 4 and 2, totaling 6, are used for the figure 6. By this method, 14 different points may be listed under this heading.

When Booth flipped through the cards to get information requested on the 5-ton trucks with flat bed bodies of 20 feet or more, he first looked at the code key inside the cover of the tray. Under the heading CAPACITY he found that the code numbers referring to trucks of 5-tons and over are 5, 6, and 7; that the key to flat top body is 1 under BODY TYPE; and the key to 20-ft. length or more is 6 under BODY LENGTH.

To get the requested information, he looked for the cards on which notches had been punched out over the figures 5, 6, and 7 above the word CAPACITY, the 1 above BODY TYPE, and the 4 and the 2 above B. LENGTH. He found, quickly, just which cards had been punched out on these holes by sticking the bayonet through these particular holes. If they had been punched out they would naturally not be caught in the bayonet and would fall to the desk, as shown in one of the accompanying photographs.

Code Translation

The Code Translation Index listed inside the cover of the filing tray comprises only classifications for which information is not typed out on the face of the card. The com-

(TURN TO NEXT PAGE, PLEASE)

FLEET FINDS FACTS QUICKLY

(CONTINUED FROM PAGE 87)

plete Code Translation Index is as follows:

Code No.	MAKE	Code No.
1. American Bantam	13. G. M. C.	
2. Autocar	14. Harley-Davidson	
3. Brockway	15. Indian	
4. Buick	16. Indiana	
5. Chevrolet	17. International	
6. Chrysler	18. Mack	1. 1923
7. Deane	19. Moreland	2. 1924
8. Dodge	20. Plymouth	3. 1925
9. Fageol	21. Pontiac	4. 1926
10. Federal	22. Reo	5. 1927

11. Ford	23. Sterling	8. 1928	21. 1943
12. F.W.D.	24. Studebaker	7. 1929	22. 1944
	25. White	8. 1930	23. 1945
		9. 1931	24. 1946
		10. 1932	25. 1947
		11. 1933	26. 1948
		12. 1934	27. 1949
		13. 1935	28. 1950
		14. 1936	29. 1951
		15. 1937	30. 1952

Note: First hole of right side of card to the left of 2 on "Brake" to be used as "2" on make.

Code No.	TYPE	Code No.
1. Sedan	5. Panel	8. 1928
2. Coupe	6. Sedan Delivery	7. 1929
3. Stationwagon	7. Screen Canopy	8. 1930
4. Pickup	8. Truck	9. 1931
	9. Motorcycle	10. 1932

YEAR MODEL	Code No.	Code No.
1. 1923	16. 1938	4. 1943
2. 1924	17. 1939	5. 1944
3. 1925	18. 1940	6. 1945
4. 1926	19. 1941	7. 1946
5. 1927	20. 1942	8. 1947

Code No.	RATED CAPACITY	Code No.
0. 2,000 lb.	4. 18,500 lb.	
1. 4,600 lb.	5. 28,000 lb.	
2. 5,600 lb.	6. 34,000 lb.	
3. 10,000 lb.	7. 68,000 lb.	

Code No.	BODY TYPE	Code No.
1. Flat bed	7. Range	
2. Dump	8. Aerial ladder	
3. Pullman	9. Low-bed semi-trailer	
4. Semi-pullman	10. High-bed semi-trailer	
5. Tree trimming	11. Special	
6. Express	12. School bus	

Code No.	BODY LENGTH	Code No.
1. 10 ft.	5. 18 ft.	
2. 12 ft.	6. 20 ft.	
3. 14 ft.	7. 22 ft.	
4. 15 ft.	8. 25 ft.	

Code No.	TYPE OF BRAKE	Code No.
1. Hydraulic	3. Air	
2. Mechanical	4. Vacuum	

Code No.	NUMBER OF CYLINDERS	Code No.
0. 2	2. 8	
1. 4	3. 8	

Code No.	NUMBER OF AXLES	Code No.
0. 2	2. 4	
1. 3	3. 5	

Code No.	NUMBER OF WHEELS	Code No.
0. 3	2. 3	
1. 4	3. 6	
2. 6	4. 10	

14—1st hole to the right of 1 on tanks
18—2nd hole to the right of 1 on tanks

Code No.	NUMBER OF GASOLINE TANKS	Code No.
1. 1	2. 2	
2. 2	3. 3	

Code No.	TIRE SIZE—(FRONT)
1. 4.00 x 18	— 4 ply
2. 4.50 x 21	— 6 ply
3. 5.00 x 15	— 4 ply
4. 5.25 x 18	— 6 ply
5. 5.50 x 17	— 6 ply
6. 5.50 x 19	— 6 ply
7. 6.00 x 16	— 4-6 ply
8. 6.00 x 17	— 6 ply
9. 6.00 x 20	— 6 ply
10. 6.00 x 20/30 x 5	— 8 ply
11. 6.50 x 16	— 6 ply
12. 6.50 x 20	— 6 ply
13. 6.50 x 20/32 x 6	— 8 ply
14. 7.00 x 15	— 6 ply
15. 7.00 x 16	— 6 ply
16. 7.00 x 20	— 8 ply
17. 7.00 x 20/32 x 6	— 10 ply
18. 7.00 x 24/36 x 6	— 10 ply
19. 7.50 x 14	— 6 ply
20. 7.50 x 16	— 6 ply
21. 7.50 x 16	— 8 ply
22. 7.50 x 17	— 8 ply
23. 7.50 x 18	— 8 ply
24. 7.50 x 20	— 8 ply
25. 7.50 x 20/34 x 7	— 10 ply — 12 ply
26. 7.50 x 24/38 x 7	— 12 ply
27. 8.25 x 18	— 10 ply
28. 8.25 x 20	— 10 ply
29. 9.00 x 15	— 10 ply
30. 9.00 x 20	— 10 ply
31. 9.00 x 20/36 x 8	— 12 ply
32. 9.00 x 24/40 x 8	— 12 ply
33. 9.75-10.00 x 15	— 12 ply
34. 9.75-10.00 x 20	— 12 ply
35. 9.75-10.00 x 22	— 12 ply
36. 11.25 x 20	— 12 ply
37. 12.00 x 20	— 14 ply
38. 30 x 31 $\frac{1}{2}$	— 6 ply
39. 34 x 41 $\frac{1}{2}$	— 8 ply
40. 34 x 5	— 8 ply
41. 5.50 x 16	— 4 ply
42. 10.50-11.00 x 20	— 12 ply
43. Solid tires	
44. Solid tires	
45. Solid tires	

(TURN TO PAGE 90, PLEASE)

**NO MORE "FREEZING"
of TIRES to RIMS!** →

**SAVE TIME,
LABOR, TIRES
and RIMS...with**

BISHMAN E-Z-OFF RIM PROTECTIVE COMPOUND

IMMEDIATE DELIVERY

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RECONDITIONS OLD RUSTY RIMS. Paint on E-Z OFF, let stand a while, then tap with hammer to remove scales. Several applications will bring pleasing results.

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in the surging thrust
of our marine motors
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SINCE 1906

Makers of Fine Automotive and Aircraft Parts

FLEET FINDS FACTS QUICKLY

(CONTINUED FROM PAGE 88)

TIRE SIZE—(REAR)

Same codes and sizes as Front.

BATTERY

Code No.

- | | | |
|-----|-------------------|---------------------|
| 1. | One battery group | 1 — 11 plate |
| 2. | One battery group | 2 — 13 plate |
| 3. | One battery group | 2A — 13 plate — V-8 |
| 4. | One battery group | 3 — 15 plate |
| 5. | One battery group | 3A — 15 plate Buick |
| 6. | One battery group | 4 — 17 plate |
| 7. | One battery group | 5 — 19 plate |
| 8. | One battery group | 6 — 21 plate |
| 9. | Two battery group | 2 — 13 plate |
| 10. | Two battery group | 2A — 13 plate |

Code Letter

- | | |
|----|--|
| A. | Power take-off |
| B. | Auxiliary trans. or 4-speed in 1½ ton and less |
| C. | Radio |
| D. | Heater |
| E. | Oil filter |
| F. | Winch |
| G. | Pump |
| H. | Patrol Equipped |
| I. | Survey Equipped |
| J. | 5-man cab |
| K. | Cab-over-engine |
| L. | 2-speed rear axle |
| M. | Cabinets |
| N. | Trailer hitch |
| O. | Turret ladder |
| P. | Overhead ladder rack |
| Q. | Booster plate |

MISCELLANEOUS

- | | |
|----|---------------------------|
| R. | David crane |
| S. | Gantry crane |
| T. | Black out masks |
| U. | Spotlight |
| V. | Red spotlight |
| W. | Red floodlight |
| X. | White floodlight |
| Y. | Fog lights |
| Z. | 4-wheel drive and Warford |

Although the figures relating to body type provide, singly and in combinations, for 14 code points, the department's fleet has, as will be seen from the Code Translation, only 12 types of bodies now in use. These extra points allow for additional body types to be included later, if desirable. This practice has been followed in other classifications. For the same purpose there are extra printed lines on the cards in case other details should be found advisable to list later.

In some of the code classifications it will be noticed that either a 2 or a 1, or both, precede the more frequent 7, 4, 2, 1. In these cases, the first 2 is read as 20, and the first 1 as 10. Thus, 24 makes of trucks may be listed under MAKE, and 44 tire sizes under each of the divisions, TIRES—FRONT and TIRES—REAR. The department has 43 tire sizes in use now.

The alphabet is also recruited in this code system and, since the classifications on the cards run clockwise, this makes the alphabet upside down. To eliminate any possibility of the cards being filed upside down, all left-hand top corners are clipped to slant.

A special hand puncher for use in cutting out the holes is provided with this particular hand key-punch system. This, with the bayonet, is all that is required.

A similar system, with larger cards, has been in use in the department since 1936, functioning as a Traffic Accident Analysis. It was the proved success of this which led Booth to work out this system on truck equipment.



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Lasting as long as and often longer than the body, trailer or tank on which installed—strongly made in every way, Hansen extends its peace-time dependency to units engaged in war-time service.

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Jack Gamble becomes Phoenix, Ariz., representative for the Kenworth Motor Truck Corp. Previously, Gamble operated his own transportation and truck terminal business, and from 1937 to 1941 was district manager and northern division superintendent of operations for the Wilshire Oil Co.



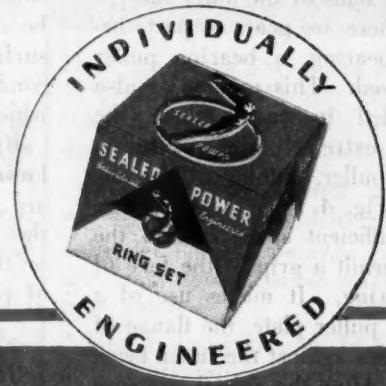


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performance in your fleet*
26 basic designs

To enable you to restore new-engine performance when you replace piston rings, the rings in Sealed Power Individually Engineered Sets are selected from twenty-six (26) basic designs. Each set is specifically engineered to insure peak performance in a particular engine. Sealed Power has been refining these sets over five years—has been producing rings for car, truck and engine manufacturers 33 years. For best results, re-power with Sealed Power motor parts. Sealed Power Corporation, Muskegon, Michigan and Windsor, Ont.

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BUY MORE WAR BONDS!



SEALED POWER PISTON RINGS

BEST IN NEW TRUCKS! BEST IN OLD TRUCKS!

Making Ball Bearings

Roll Out More Miles

(Continued from Page 63)

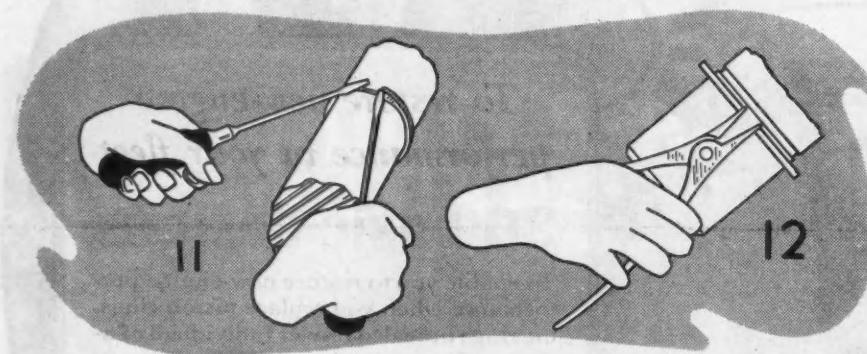


Fig. 11. One screwdriver holds snap-ring from turning while another is used to pry the free end out. Fig. 12. Special pliers are available for this type of work

ings from shafts, provided the shape and size of the shaft permits. In this method the shaft is placed in a jig and wood or soft metal blocks placed under the bearing so that it is supported by both rings. Pressure applied now through the press will not damage the balls or the outer race.

Where there are gears or parts behind the bearing, a bearing puller must be used. This method is also recommended in cases where the bearing is extremely difficult to remove. A puller, similar to the one shown in Fig. 4 is employed where there is sufficient space behind the gears to permit a grip of the face of the inner ring. It makes use of a split collar puller plate, the flange of which presses against the inner bearing ring. After the initial pressure has been applied through the puller screw, the opposite end of the shaft can be tapped with a small mallet to start the bearing.

It should not be necessary to state that there is no method given in any manual for removal of bearings with a hammer and chisel. The damage resulting from such methods is obvious.

Analyzing Failures

On jobs where bearings have given

unsuccessful service, the trouble can sometimes be determined by checking the old bearing. For this reason they should be abused as little as possible in removal and balls and races carefully examined. Scratched surfaces of the balls or races indicate the presence of dirt. Checks in the races can be caused by overheating. Scored surfaces can be a result of several conditions, the most probable of which is too tight an adjustment.

Brinelled surfaces point to too loose adjustment. Corroded bearings are a result of an acid condition in the lubricant, and roughened areas on the balls or races may be a result of poor lubrication.

Checking Bearing Seats

The shaft diameter should be measured with a micrometer at several places to check the diameter of the bearing seat and for possible shaft taper. The bearing should fit the shaft tight enough to prevent a creeping or slipping of the inner ring, which would cause the surface metal of the shaft to scrub and wear off. This working tends to produce a fine powder and shows up in a brownish stain on the shaft or bore of the bearing. This is not serious unless it continues at a rapid rate.

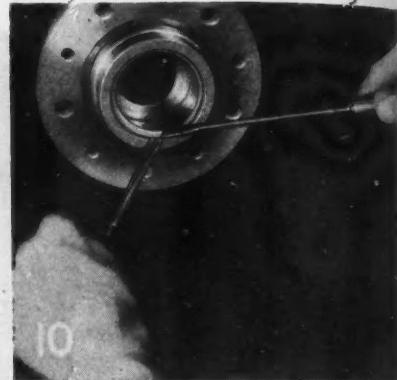


Fig. 10. Snap-rings in housing are easily removed with two screwdrivers as shown above

If the shaft surface is machined for the bearing seat, it is important not to leave machining ridges, as they will flatten down and leave the bearing loose. Seats should be ground for best results. Dressing them down with emery cloth is not recommended, since it is hard to keep the shaft round or straight.

Shaft shoulders should be exactly square with the bearing seat. If left tapered so that the inner edge of the bearing touches the shoulder, it will break down very quickly under heavy thrust, leaving the bearing loose between the lock nut and the shoulder. The squareness of the bearing is determined by the squareness of the shoulder. The shoulder can be checked by running an indicator axially against the shoulder and rotating the shaft. If one is not available and the shaft has an undercut, and a large shoulder, a square can be used as shown in Fig. 5.

Where the bearing seat and the shaft shoulder are ground, it is important to see that the fillet does not become larger as the grinding wheel wears. The shaft fillet is a true radius and should be kept within the specifications given in all catalogs under the heading "Radius in inches." Where the shaft has adequate length, an undercut is preferred instead of a fillet. Especially where the bearing is on the end of the shaft, an undercut is best because it means one less dimension to watch and gives assurance of a good shaft seat. The three drawings on this page show individual cases where the shaft fillet is too large (Fig. 6) to permit proper seating of the inner bearing ring, the

(TURN TO PAGE 95, PLEASE)

BALL BEARINGS

(CONTINUED FROM PAGE 92)

shaft shoulder is too small (Fig. 7) to support thrust load of the bearing, a condition mentioned earlier, and the correct shaft shoulder and fillet clearance (Fig. 8).

Seat Grinding Procedure

The efficient application of ball bearings is determined to a large degree by the accuracy obtained in grinding the bearing seat and the shaft shoulder. The grinding wheel must take out all the inaccuracies in turning and any eccentricity due to warping in hardening. If accurate results are obtained, steady rests must be used.

Close attention should be given to the centers and center holes. The center holes should be frequently checked and lubricated during the process. The grinding wheel must be perfectly balanced. The side of the wheel can be brought over against the shoulder, giving it the ground finish and squaring it on the same axis of rotation as the bearing seat. The shaft fillet is ground with the edge of the wheel. A wheel concaved or relieved on either or both sides is particularly suited to this type of work as it requires no dressing on the sides. Because of the smaller area of contact, a freer and cooler cutting action is obtained. See Fig. 9.

The best results are obtained from aluminum abrasive vitrified bonded wheels, ranging in grit size from 36 to 60 and in grade from K to M inclusive for materials of high tensile strength such as steel and alloys. The grinding wheel should run at a surface speed of 6000 to 6500 feet per minute.

Before finish grinding, the wheel must be retrued fine. This is accomplished by reducing the table traverse to the slowest speed comparable to the finish desired and reducing, at the same time, the amount of feed of the wheel into the diamond.

Installing On Shaft

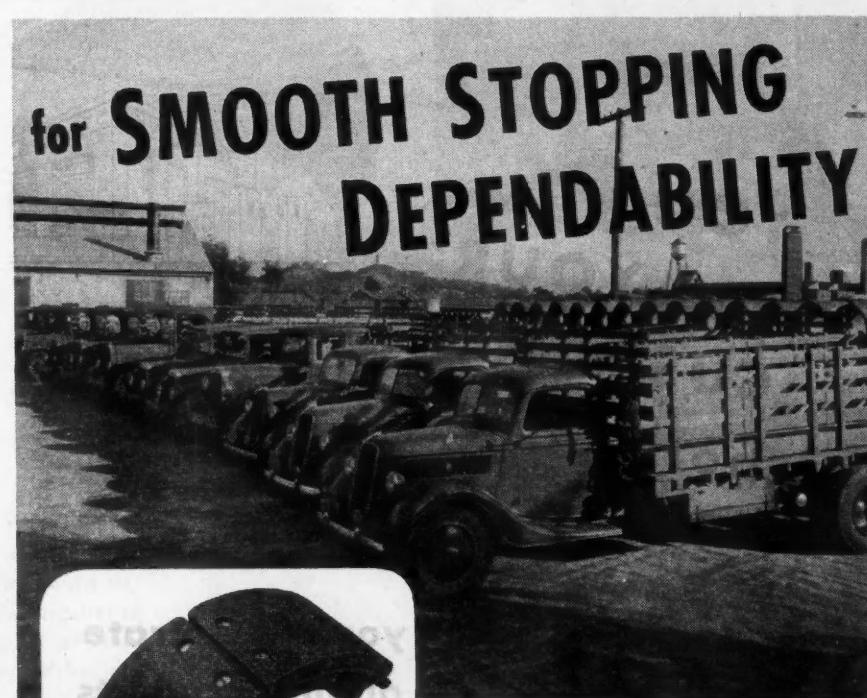
Correct assembly practice is essential for anti-friction bearings. The most common method for assembling bearings on shafts is to press them on with a small hand press or drive them into place with a drift pipe and hammer. Both methods are equally effective, but in either case, it is neces-

sary to observe the following precautions. First, make sure the shaft is smooth and clean. Remove all burrs on the shaft shoulder and at the beginning of the bearing seat. Check the shaft fillet to make sure that it is not too large and that it does not interfere with the inner ring corner radius. It is desirable to run the lock nut down on the threads once to remove any fine scale that might be dropped later into the bearing.

In starting a bearing on a shaft,

be sure it is square. Make sure that the bearing is right side up. Rub a few drops of oil on the shaft and after it is placed in the vise, in the manner described in removal, fit the drift pipe over the shaft so that it contacts the inner ring only. If the pipe is too large, a spacer may be used. It should be held squarely so that the sides do not burr the shaft threads. Soft metal hammers are not recommended because chips are apt

(TURN TO NEXT PAGE, PLEASE)




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BALL BEARINGS

(CONTINUED FROM PAGE 95)

to come off and fall into the bearing. If a press is used, pressure should be applied uniformly without forcing the bearing in case it sticks. Sticking usually means high spots, tapers or burrs on the shaft. Care should be taken that the bearing bottoms against the shoulder. This can be checked by the solid feel under the hammer blows.

Assembling Bearings

In checking bearings after mounting, try to insert feelers between the inner race and the shaft housing all the way around. Make sure that the shaft shoulder has a sufficient seat on the ground flat side surface of the bearing. See that the outer race is still perfectly free on the inner race. If the press fit on the shaft is too tight, the bearing will bind and an early failure will result. Be sure that when the nut is pulled down and the

lock washer is bent over, that chips do not fall into the bearing.

Hot oil assembly is not recommended for three principal reasons. First, if the bearings are allowed to rest in the bottom of the pan, they may become overheated and softened. Second, the oil is hard to keep clean, and third, the procedure does not permit checking the press fit by the amount of pressure required to assemble the bearing on the shaft.

Except for large bearings, the hot air method is preferable. In this practice the bearings are left in the boxes and put into an electrically heated furnace, with the air transferring the heat to the bearing. Temperatures should range between 160 and 180 deg. Fahr.

The following checks should be made whether using the hot air or the hot oil method.

1. Use the equivalent of a double boiler so that the oil will not overheat or heat too much in one spot.
2. Keep the oil as clean as possible when using hot oil method.
3. Check the shaft for size before assembly.
4. Be sure the bearing is bottomed against the shaft shoulder.
5. Pull the lock nut down before the bearing is cool.
6. Check the feel of the bearing after assembly and after it has cooled.
7. Grease again, as heating leaves the bearing dry.
8. Cool bearing down before assembling in housing.

Duplex Ball Bearings

It is very important that duplex bearings be mounted in the correct way. Duplex bearings can usually have a looser fit than other standard type ball bearings because thrust load is usually predominant. They may be mounted in three different ways to suit different loading conditions. They are shipped in pairs, wired together in the direction of mounting for which they are to be employed. In construction, the bearing has a counterbored outer ring, giving a deep shoulder on one side and a shallow shoulder on the other. Thrust is taken by the deep shoulder. It can be identified because it is always the stamped side of the bearing.

For thrust and radial load both inner and outer rings are clamped with the deep shoulder to the outside. This

(TURN TO PAGE 98, PLEASE)

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and YOUR
CUSTOMERS
both gain . . .
when you concentrate
on P & D quality products



P & D has always concentrated on the manufacture of quality starting, lighting, ignition replacement parts for trucks, buses and passenger cars.

Service station owners and mechanics have long known of the three benefits to both customer and themselves by concentrating on the P & D line.

1. Minimum inventory because of one complete line.
2. The best is always at hand because P & D makes only one quality . . . the best.
3. Customer satisfaction because good work plus P & D parts mean peak performance.

YOU CANNOT PURCHASE ANY FINER QUALITY



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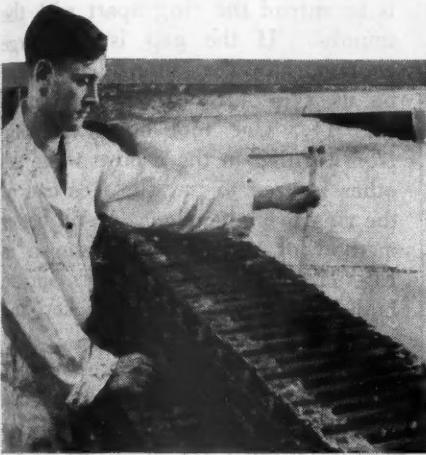
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GATE CORROSION

Why semi-rigid bat

FIBERGLAS* INSULATION

does not settle or pack



1. Fiberglas is composed of springy fibers spun from molten glass. It is light, non-burning, non-decaying, non-absorbent, acid-resistant, and high insulating efficiency.

2. The springy glass fibers are shown here 12 times actual size. Formed into semi-rigid bats with a plastic binder, Fiberglas is permanently resilient and will not settle or sag.

3. Cut slightly oversize, Fiberglas semi-rigid bats compress to fit, actually expand under vibration. Self-supporting, it will not pack down, leaving empty uninsulated spaces.

WILL YOUR POST-WAR refrigerated models embody the latest advances in insulation? You can get the last word on up-to-date methods from Armstrong's engineers. And you'll find a complete range of efficient materials in the Armstrong Line. Fiberglas is only one of them. Armstrong offers also:

LK CORKBOARD. For heavy-duty equipment where structural strength and maximum moisture resistance are needed—frozen food trucks and ice cream trucks—this long-lasting, dependable insulation combines high efficiency and light weight. It is strong, rigid—helps support heavy loads, helps absorb vibration.

TEMLOK INSULATION BOARD is also strong, rigid, and efficient. It is recommended for cabinet bottoms and mounting boards under mechanical units. Made from the fibers of long leaf southern pine, its natural resins give Temlok high moisture resistance.

FOR COMPLETE INFORMATION, write or wire today to Armstrong Cork Company, Building Materials Division, 3502 Concord Street, Lancaster, Pennsylvania.



* Reg. U. S. Pat. Off. Owens-Corning Fiberglas Corp.



4. Fiberglas fits snugly in place—fills all available space without support—edges knit together. It's quick and easy to fit Fiberglas insulation into truck bodies. Production lines are speeded.

ARMSTRONG'S EQUIPMENT INSULATION

LK CORKBOARD • FIBERGLAS • TEMLOK

BALL BEARINGS

(CONTINUED FROM PAGE 96)

mounting allows the bearing to take care of a moderate amount of misalignment, with a total angular movement of $\frac{1}{8}$ deg. for the standard and about $\frac{1}{4}$ deg. for duplex with small internal looseness.

Snap Ring Bearings

Snap ring bearings are mounted so that the thrust is taken against the

shoulder of the end cover; the reverse thrust is taken by the snap ring itself. The snap ring and groove are made to close limits, permitting accurate location of the bearing. For this reason the following precautions should be taken in handling the snap rings.

1. Do not twist the ring out of shape.
2. Do not mar corners of ring or ring groove.
3. Do not yank ring open in spreading.

4. Do not tap the ring after shaft assembly.

5. Do not jam screwdriver into the bearing.

6. Maintain a clearance between the ring and the shaft when assembling.

7. Keep tools and hands clean.

Assembling Lock Rings and Nuts

The most common method of assembling the lock ring on the shaft is to spread the ring apart with the thumbs. If the gap is not large enough, however, screw-drivers can be used to advantage as shown in Fig. 11. One tool holds the ring from turning in the groove while the other is used to pry the free end of the ring over the edge. A still better method of assembling is shown in Fig. 12, where special pliers spread both ends at once for quicker and easier progress.

Lock washers should be used to insure positive locking of the nut. When the tangs break or the washer becomes pounded out, it should be replaced.

The proper tool for assembling lock nuts is the spanner wrench. Mounting with a drift pin and hammer is permissible in emergencies but care should be taken so that the nut is not damaged and that metal does not fall into the bearing. A hammer and chisel should never be used under any circumstances.

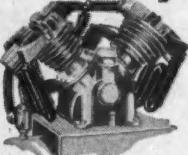
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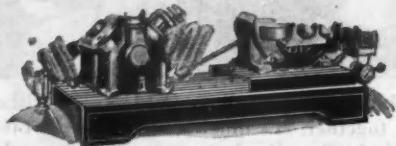
By comparison - You'll buy PAR



Check valve noise and trouble are "has-beens" with the Par non-pulsating check and safety valve. The Par valve remains open during the pumping cycle and closes only when compressor cuts out, eliminates wear and tear on the valve, and makes for quieter operation and longer life. A feature pioneered by PAR.



To keep air entering tank cool and contracted, not inflated with heat, all Par units have large surface Spiral Finned inter- and after-coolers for fast radiation. Air is held to slightly higher than room temperature — You get maximum volume of usable air per pound of pressure — cuts operating time, operating cost.



All valves, switches and gauges are at either end of tank, with the compressor and motor mounted on a heavy steel sub-base saddle, to permit ease of cleaning, servicing, and adjusting. The sub-base, tank, and feet have baked enamel finish that holds its bright red color, prevents rust and is easy to keep clean.

These are just 3 of Par's many outstanding features — features that are designed for efficient, economical, trouble-free service. Get all the facts... COMPARE and you'll buy Par. See your Par Jobber or write today for our illustrated catalog and complete details.

Lynch •
PAR
DIVISION
MANUFACTURING CORPORATION
DEFIANCE, OHIO, U.S.A.



The shuttle system of transportation has found a parallel in warfare. Here is a mobile aircraft gun mounted on a Fruehauf trailer. It has been spotted in position while the tractor has gone about other duties.

For Faster Starting



AND SMOOTH RUNNING HORSEPOWER

● Quick, motor saving starts and smooth, free running horsepower are mile-after-mile results when you use Casite.

Casite cleans out motors, keeps them clean and powerful. It retards formation of the sludge and gum that steal horsepower.

In addition, Casite is a carrier of lubricant—it leads oil into hard-to-reach places . . . cuts down engine wear.

Your maintenance cost records will prove Casite's value for your entire fleet.

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A Pint in the Crankcase Every Oil Change . . . and a Pint Through the Air Intake Every Three Months



WHY YOU NEED CASITE

- It quickly cleans out harmful sludge deposits.
- Retards the formation of engine varnish.
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- Gives better and smoother performance.



CASITE

CLEANS OUT MOTORS
KEEPS MOTORS CLEAN

IT'S A PRIVILEGE TO BUY WAR BONDS

ADJUSTING ENGINES TO LOWER OCTANE GAS

(CONTINUED FROM PAGE 40)

spark advance with partial throttle are lost.

To check the operation of the transfer valve, start the engine and gradually open the throttle to full open position where the governor butterfly is controlling the engine speed. Watch the vacuum advance mechanism while opening the throttle. When the throt-

tle is first partially opened, the vacuum advance should advance. As the throttle is opened farther, the vacuum advance may change, but at governed speed, i.e., partial opening of governor butterfly, the vacuum advance should be advanced. If correct operation is not obtained, the governor mechanism should be cleaned and overhauled.

Fuel Pump Delivery Pressure

Insufficient fuel pump delivery and volume are factors which tend to pro-

duce detonation under heavy loading. An engine may operate satisfactorily and without detonation at moderate speeds and loads, but when maximum power is required, it may give indication of "lean" fuel mixture. This "lean" effect may be caused by a worn fuel pump.

If the delivery pressure of a fuel pump is low and approaching the point where it may not deliver gasoline to the carburetor, the pump may be satisfactory at moderate engine loads where less fuel is required. But it may fail to keep the carburetor fuel bowl full when there is a high requirement for gasoline because of a maximum power operating condition. A low carburetor fuel level under these conditions will result in a "lean" air-fuel mixture. For this reason, fuel pump delivery pressures should be checked when an engine is readjusted for use on lower octane gasoline.

Due to the fact that correct fuel pump delivery pressures vary for different installations, engine manufacturers' recommendations should be followed wherever obtainable. A fuel pump pressure of about 3 lb. per sq. in. at the carburetor is generally recommended for heavy-duty service.

Vapor-lock troubles are frequently aggravated by low fuel pump pressures. Loose joints or small air leaks in the fuel suction line can also effect fuel pump operation.

Other Adjustments

If correct adjustment of the spark timing and fuel pump do not produce satisfactory operation with 70 octane gasoline, there remain a number of other items of condition or adjustment which should be further inspected to determine if they are incorrect and are the cause of unsatisfactory engine operation. These items occur less frequently but nevertheless if incorrect, may have a decided effect on octane requirements.

Carburetor Adjustments

Fuel mixtures which are "lean" aggravate the knocking tendencies of an engine and increase its octane requirements. In the case of truck engines which operate consistently at a high percentage of rated horsepower, it is desirable that the air fuel ratio be approximately 12.8-1 to 13.6-1, in the intermediate operating ranges. At

(TURN TO PAGE 102, PLEASE)

MARGIN of Victory
The march of important national events has sometimes been determined by the narrowest of margins. For instance, the Constitution of U. S. was ratified by the State of Rhode Island only by the slim margin of TWO VOTES - 34 TO 32! But it takes more than a close decision to create a yardstick of preference in Truck and Bus equipment. Such equipment must star—by the WIDEST of margins. No wonder YANKEE leads the field!

MARGIN of Quality
Yankee automotive devices have always had that EXTRA margin of Quality—enough to make them winners and therefore the standard of acceptance. Their rugged "staying qualities" have made them "tops" at the pay-off.

MARGIN of Safety
Fleet Operators and the "pilots of the road" know the value of a safe haul. Rigidly controlled scientific testing of Yankee Products by Yankee Engineers and then by recognized reputable testing laboratories has always given Yankee merchandise that EXTRA margin of safety so important these wartime days. No wonder the man behind the wheel says "You're safe when you can see or be seen with Yankee Safety Devices."

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By a WIDE Margin... it's **YANKEE!**

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STOP LIGHTS • TAIL LIGHTS • DOME LIGHTS • DIRECTIONAL SIGNALS

ASK YOUR JOBBER SALESMAN

YANKEE METAL PRODUCTS CORP., NORWALK, CONN., U. S. A.

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this Test*



Immerse any rusty nail in a small quantity of Cities Service Rust Remover. If badly rusted, allow to remain for several minutes. You can actually see the rust dissolve.

CITIES SERVICE RUST REMOVER has been tested for four years throughout a small, highly industrialized area in the East, where it has earned a unique reputation for performance. RUST REMOVER is a clean, clear liquid, practically odorless, non-inflammable, easily applied,

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and harmless to handle by those not allergic to specific chemicals. It is fast-acting, and, although heating somewhat accelerates results, general application is recommended at normal temperature (60°-90°F). RUST REMOVER is effective on chromium, copper, aluminum, steel and iron.

See a Free Demonstration of Rust Remover on Your Own Equipment.

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ADJUSTING ENGINES TO LOWER OCTANE GAS

(CONTINUED FROM PAGE 100)

manifold vacuums under 6 in. Hg., which occur with wide-open throttle, the air fuel ratio may approach 12.0-1 to 12.5-1. Incorrect air-fuel mixtures can be caused by many other items than fuel jets, all of which should be corrected before "fiddling" with carburetor jets.

A low fuel level in the carburetor bowl can also give the effect of a

"lean" mixture. Some carburetors are equipped with fittings which will permit checking the level with the engine idling.

The "power" jets in a carburetor may cause incorrect air fuel mixtures if they fail to operate correctly, especially in the full power or low manifold vacuum ranges. Delayed operation of the "power" jet, or when the jet fails to operate, may result in "lean" mixtures under full throttle conditions. Too early operation of the "power" jet, on the other hand,

may cause too "rich" mixtures at partial throttle and, therefore, a waste of gasoline.

Inoperative "accelerating" pumps, either mechanical or vacuum operated, can give the effect of "lean" mixtures during engine accelerations when getting a heavy load under way.

Air Leaks Into Intake Manifold

Air leaks into the engine intake manifold may cause "lean" carburetor mixtures and the resulting "lean" mixtures may not be due to carburetor adjustments. Such air leaks frequently effect idle operation. Sources of air leaks are manifold gaskets, vacuum operated devices and connecting hoses of windshield wipers, vacuum operated fans, vacuum booster power units and vacuum brake units.

There are a number of ways of checking the amount of leakage in a vacuum brake system. One test set up to check overall leakage in the system is to install a vacuum gage and a shut-off cock in the line leading to the power unit near the intake manifold. The shut-off cock should be placed close to the intake manifold and the vacuum gage should be connected into the vacuum line between the shut-off cock and the vacuum power unit.

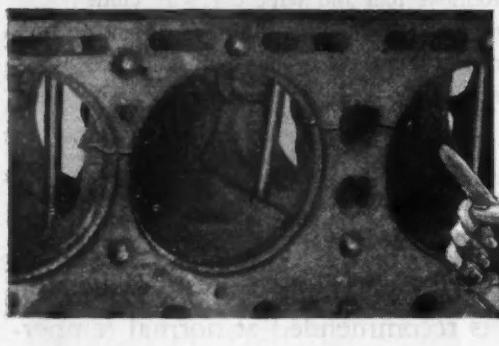
To make the test, run the engine at idle speed and note the vacuum produced in the brake system with the shut-off cock open. Then close the shut-off cock and observe the rapidity with which the vacuum falls to zero. In a new vacuum brake cylinder installation with new vacuum hose and tight joints, the loss of vacuum should not exceed 2 in. mercury per minute. With usable worn vacuum units, the loss of vacuum should not exceed 10 in. mercury per minute. If the vacuum loss exceeds this rate, it is an indication of serious air leaks in the vacuum system which should be corrected.

Spark Plugs

Spark plugs with an incorrect heat range and which operate too "hot" for the engine and its specific service may also cause detonation. When the lower end of the porcelain of a spark plug is cracked or broken, the broken part remaining, or the electrode, may become much higher than normal, and this may cause detonation.

(TURN TO PAGE 105, PLEASE)

ANY APT MECHANIC CAN REPAIR CRACKED BLOCKS AND HEADS THE K&W WAY...



Yes, any mechanic of ordinary aptitude can efficiently repair cracked engine blocks or heads—by the K&W Mechanical Method. Shop operators everywhere are restoring, right in their own shops, cracked engines once considered BEYOND REPAIR! K&W Mechanical Method is standard practice among leading engine rebuilders, fleet operators, railroads, and military repair centers. In most cases, the whole job is done in an hour or two without dismantling. The most complicated repairs, involving a number of cracks, seldom require more than six or eight hours!

GUARANTEED REPAIR FOR 85 OF 100 BLOCK AND HEAD CRACKS IMMEDIATELY!

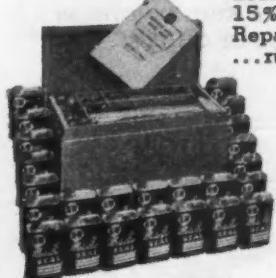
K & W Metallic Seal is effective for all types of heat or freeze breaks except those (fewer than 15%) so large they require a K & W Mechanical Repair. Pour K & W Metallic Seal in the radiator ... run engine 30 minutes...cracks are sealed.



NO. 600 SERVICE UNIT WILL DO 24 JOBS

Everything needed to do 24 average jobs can be had for so little that the savings on only one job often pays the whole cost!

For complete details on K & W Mechanical Method, see your jobber—or write us direct for literature.



KERKLING & COMPANY
BLOOMINGTON, INDIANA

ADJUSTING ENGINES TO LOWER OCTANE GAS

(CONTINUED FROM PAGE 102)

Carbon Deposits

Heavy carbon deposits in the combustion chamber may be the reason why an engine apparently requires a higher octane gasoline than might otherwise be used. These deposits may be caused by a number of factors and, where bad deposits are found, the gasoline vendor, engine oil vendor and engine manufacturer should be consulted for possible remedies.

In heavy-duty service, where engines operate quite hot, but are correctly adjusted, carbon deposits tend to stabilize themselves and may not cause sufficient trouble to warrant carbon removal. In many cases, from a piston ring and a general varnish or gum condition standpoint, the operation and condition of hot heavy-duty engines seems to be greatly improved by the use of additive type oils containing both anti-oxidant and detergent additives. These additive type oils, meeting Army specification 2-104B, are available to truck operators, although they are not available for passenger-car use. The oil vendor should be consulted before starting to use this type of engine oil.

With cold operating engines, where water sludge is a problem, the use of detergent type oil is frequently unsatisfactory. There have been reports, however, that periodic "purges" with gum solvents have been helpful both in reducing carbon and gum deposits and in keeping piston rings free. With cold running engines, the vendor should be consulted regarding the use of either gum solvents or additive type oils. While engines in low power output service or cold operation may have carbon and gum deposits of various types, because of their low output and partial throttle operation, the carbon deposits may not affect their octane requirements beyond the limits that can be corrected by retarding the spark.

Mechanical removal of carbon is an expensive and labor consuming job, so that in most cases it is a logical compromise to retard the spark timing as necessary to avoid excessive detonation, which may be the result of carbon deposits, rather than to remove the carbon mechanically.

Water and Crankcase Temperature

It is generally considered that 150 deg. to 170 deg. water jacket temperature is the optimum operating temperature. If these temperatures are continuously exceeded, the octane requirements of an engine may be increased. Where detonation is a problem, water jacket temperatures should be checked and corrected if too high.

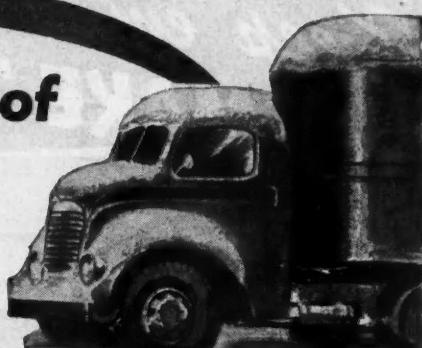
For cold weather operation or when engines operate at low tempera-

tures, alterations should be made to increase the water temperature. When alcohol type anti-freeze is used, 150 deg. is about the top limit.

The normal operating temperature of the cooling water can be varied by the use of different temperature range thermostats, radiator covers, or different sized pulleys on belt driven water pumps.

Because of the greater possibilities of crankcase dilution with the lower volatility of wartime gasolines, there

(TURN TO NEXT PAGE, PLEASE)



Winterproof IGNITION NOW!

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APPROVED QUALITY PRODUCTS

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- Distributor
- Coil
- Condenser
- Voltage Regulator and Generator
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BUY WAR BONDS

Where ignition units are beyond servicing, replace with NIEHOFF Approved Quality Products that protect the battery, conserve gas and oil, assure quicker starting and new car performance. NIEHOFF Ignition Parts are available through a national network of NIEHOFF Jobbers.

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CARE WILL SAVE YOUR TRUCK

ADJUSTING ENGINES TO LOWER OCTANE GAS

(CONTINUED FROM PAGE 105)

are real advantages in increasing the crankcase temperature during cold weather or on cold operating engines. Insulating coatings can be applied directly to the lower crankcase, or baffles can be arranged to keep cold air from directly striking the crankcase pan.

Corrosion and Scale Deposits

Rust and corrosion deposits may partially plug the radiator and water passages. Corrosion may also attack the water pump impeller and cause reduced water circulation. All of these factors may permit excessive operating temperatures, which may increase the octane requirements of an engine.

Rust and corrosion can be removed from the engine by chemical means and by reverse flushing. Badly

plugged radiators frequently require removal of the tanks and "rodding" of the tubes. The regular use of rust and corrosion inhibitors is recommended in cooling water to prevent rust and corrosion.

In certain parts of the country, hard water scale deposits may build up in the water jackets around the combustion chambers. Such scale deposits insulate the cylinder walls from the cooling water and result in increased temperatures of the combustion chamber walls. These higher temperatures of combustion chamber walls increase the octane requirements of an engine. The scale deposits can be removed by chemical means and, where detonation is serious because of such scale, the hard water scale deposits should be removed. Certain water softening methods do not remove the scale-forming mineral salts from the water and such "softened" water may still produce scale or deposits in the engine water jackets. Where scale trouble is experienced, the water source and treatment should be investigated for scale forming characteristics. In areas where water is very "hard," it may be desirable to use rain water in radiators.

Hundreds of fleet owners are getting more miles and longer service from their trucks by keeping them clean with HYPRESSURE JENNY STEAM CLEANER, because periodic JENNY Steam Cleaning often reveals cracks and defects in equipment permitting repairs before costly road failures occur . . . rids chassis of accumulated dirt that may add as much as 400 pounds extra weight to the load . . . reduces fire hazards. Besides, HYPRESSURE JENNY Steam Cleaning before repairs, conserves pre-

cious man-hours by saving up to 40% of mechanics' time usually wasted wiping dirt and grease from tools and equipment. JENNY is handy in the shop and garage, too, for cleaning floors, pits, runways, walls, windows, etc., quicker and better than by any other known method.

You too, can keep your trucks hauling and make 'em last longer by keeping them clean the JENNY Steam-Spray Way. Write for complete details, without obligation, of course.

HYPRESSURE JENNY DIVISION OF

HOMESTEAD VALVE MFG. CO.
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Operating Factors

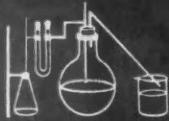
While correct adjustments by the maintenance mechanic will do much to reduce an engine's octane requirements, the actual manipulation of the vehicle's controls by the driver can offset much of the mechanic's work. This is especially true with engines which were designed for maximum power output with 76 octane or better gasoline.

Tests have been made which show conclusively that practically all engines can be operated with 70 octane or lower gasoline, if the load on the engine is reduced so that maximum power is not required, and if the driver manipulates his engine and transmission controls carefully. For these reasons, it is evident that higher than 70 octane gasoline is only necessary where maximum engine horsepower is needed for moving the vehicle and load.

Overloading Vehicle

Overloading of a truck or tractor-trailer obviously compels the engine to operate at full throttle more con-

(TURN TO PAGE 108, PLEASE)



Chemistry

THE WORKER OF MODERN MIRACLES!



WHIZ MOTOR RYTHM Banishes

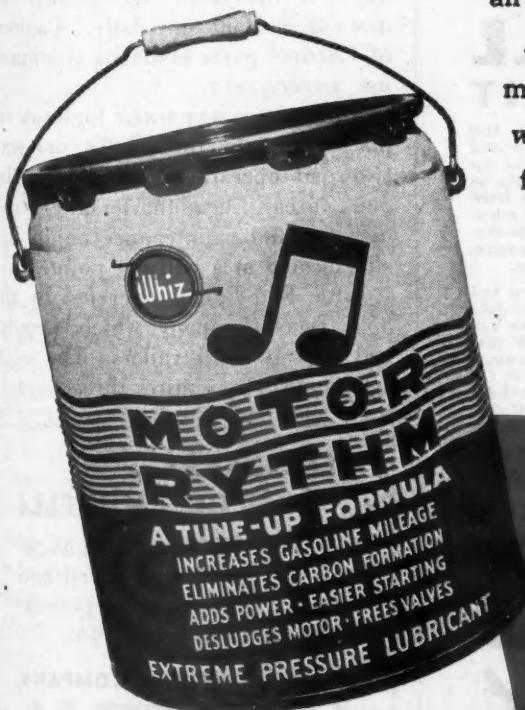
COLD WEATHER DRIVING TROUBLES!

Merely adding WHIZ MOTOR RYTHM to the crankcase will assure quick, easy starting on the coldest day!

In addition, used in the transmission and differential, MOTOR RYTHM means fingertip gearshifting all winter long!

And WHIZ MOTOR RYTHM is the modern, *chemical* motor tune-up that every fleet owner needs—*winter and summer*—to keep truck, bus and cab engines free of harmful deposits of carbon, gum, sludge, and varnish . . . to stop bucking and ping due to carbon . . . to cut operating and maintenance costs.

R. M. Hollingshead Corporation, Camden, New Jersey;
Toronto, Canada.



BUY MORE WAR BONDS



ADJUSTING ENGINES TO LOWER OCTANE GAS

(CONTINUED FROM PAGE 106)

tinuously. Under these conditions, and at lower engine speeds, detonation may be aggravated. Since wartime engine bearings are, in many cases, of reduced quality, both detonation and overloading must be avoided in order actually to preserve the engine.

Because neither the driver nor the

mechanic have control over loading, those persons responsible for vehicle loading must also be informed as to the effects of wartime gasoline.

Design Characteristics

While the design characteristics of combustion chamber, compression ratio and manifold distribution have an effect on octane requirements and detonation, there is little the operator can do to change these built-in features. Extra cylinder head gaskets and gasket spacers can be used and

sometimes the engine manufacturers can supply lower pistons, or cylinder heads with lower compression ratios. Certain cylinder head gasket manufacturers have announced double thick cylinder head gaskets for certain engines. As a rule, such changes should be a last resort since they may produce other maintenance problems and, in the case of extensive alterations, do introduce additional costs. Operators are advised to make such changes only after consultation with both the vehicle manufacturer and the gasoline suppliers, and only when continuous detonation is experienced after all other possible adjustments and corrections have been made.

END

(Please resume your reading on P. 41)

Baby Red Ball Express Supplies Paris

A baby Red Ball Express is now running daily over the famous Cherbourg-Paris road network along which the original Red Ball Express hauled the supplies which kept the armies pushing to the German border. Running 400 miles between freight points in Normandy and Paris, the new route has a daily target of 100 tons of high priority cargo.

Papa Red Ball, discontinued in November, had carried more than 500,000 tons of supplies during its 81 days of operation—an average of more than 5000 tons daily. Capture of Channel ports made its continued use unnecessary.

A direct two-way traffic highway replaces the old Red Ball's one-way two-road operating procedure. Bivouac areas, headquarters, control, dispatch and maintenance points are still located at a halfway point.

Little Red Ball is operated by the 3582 Truck Company, which is equipped with 10 semi-trailers. The average round trip requires three days.

CLEAN FAST— CLEAN WELL!

Use Magnus Methods and Materials to clean fast and well and insure a really effective preventive maintenance program.

MAGNUS CHEMICAL COMPANY
38 South Avenue, Garwood, N. J.



Where She Stops
Nobody Knows...

BUT You do Every Job Right!

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WELD-ALL
ELECTRODE KIT

You're a winner every time with this handy Weld-All Electrode Kit no matter what the job. It contains the right rod for every welding job . . . every rod a leader in its class! You'll get maximum returns from your welding equipment with these scientifically engineered rods. Each type is specially designed to meet the exact requirements of its particular kind of welding.

Your welding jobs have to stand up and take the "gaff". No matter what the job, these rods in the Weld-All Kit will give you tough, rugged, "just like new" welds that can really take it. You'll get vital transportation back on the road quicker and at far less cost with a MARQUETTE Weld-All Electrode Kit in your shop. If your distributor is unable to supply you, write direct.

The Key to Better Welding

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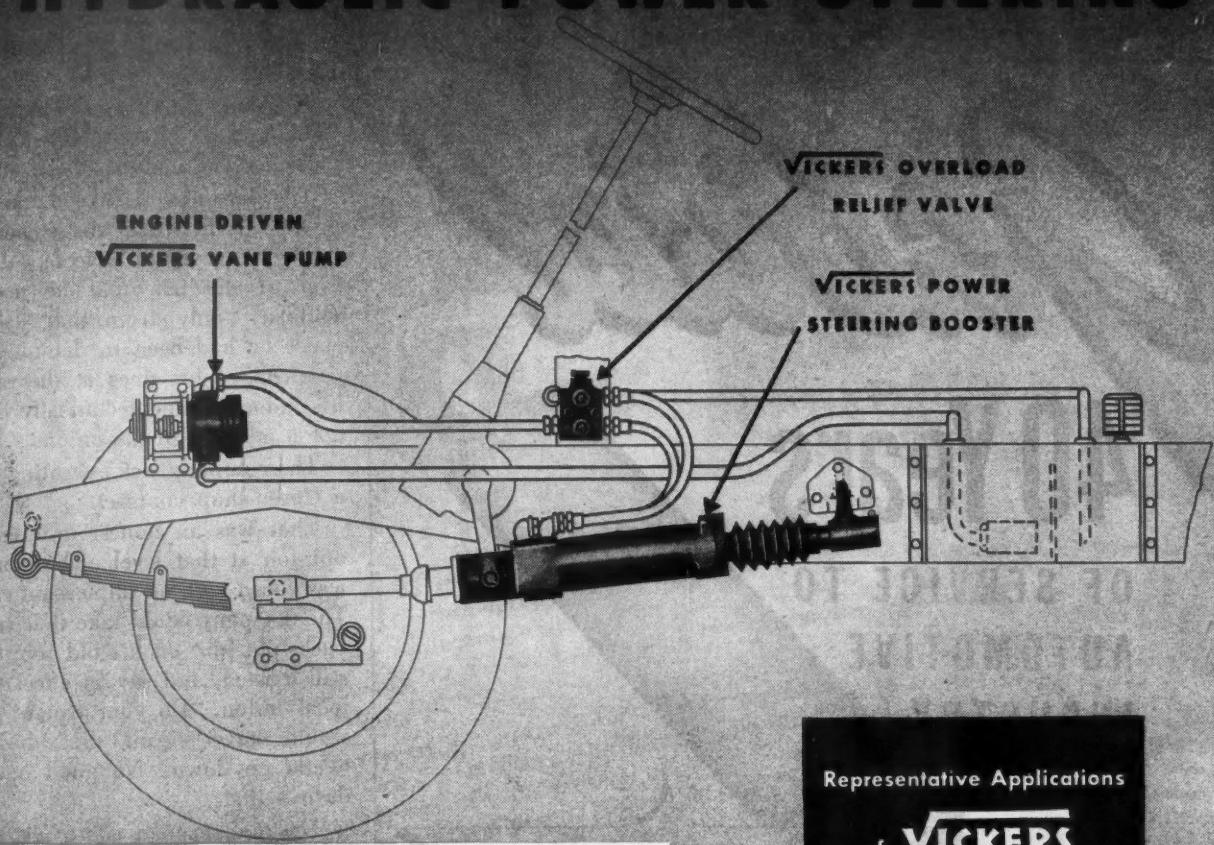
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WELDING
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COMPACT

HYDRAULIC POWER STEERING

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Advantage of

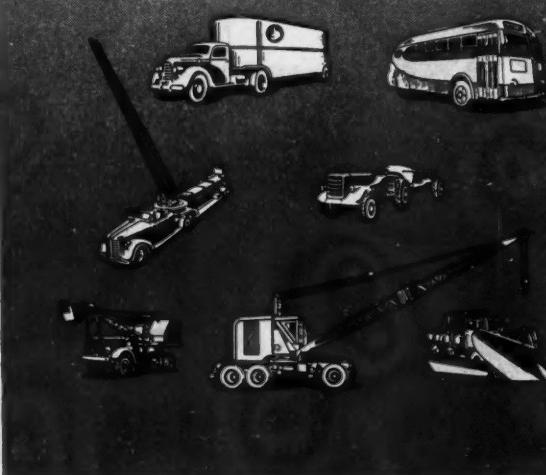


Requiring only a minimum of space for installation, the Vickers Hydraulic Power Steering System can be applied to most existing hand steering mechanisms with a few simple alterations. The separate power cylinder (booster) can be located where it does not interfere with other apparatus—and where the power will be applied directly to (and in line with) the drag link. No additional space is required at the end of the steering column where space is usually at a premium.

Other important advantages of Vickers Hydraulic Power Steering are: effortless, positive and shockless steering . . . road shock thrusts are transmitted to the frame of the vehicle instead of to the steering gear . . . automatic overload protection . . . reduced operator fatigue . . . greater road safety . . . automatic lubrication . . . and 15 years of successful operating experience. Bulletin 44-30 gives complete information about Vickers Hydraulic Power Steering; write for a copy.

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REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 57)

We have had a few, and a very few, cases of chiseling. I might say that those occur more frequently in the white-collar jobs. Where the case involves an hourly employee, we have been able to adjust it and usually with the help of labor representatives working in conjunction with management. The white-collar

man, perhaps, is less fortunate, and particularly is that true when he is in a high bracket of income.

Major Gross has given you the requisites of re-employment but let's take factual cases and see how those rules some times are not followed, and some times to the detriment of industry.

This is an actual case of an over-the-road driver, running from a city within Pennsylvania to New York, well up on the seniority list. The bumping-board was no problem to

him at the time that he went into the service. He bid that particular run in and he was able to hold it.

This man was drafted and the first condition of the Act was met. That is something that is frequently overlooked—the man must be taken away from his job because of military service.

The veteran served but a few months and was discharged because of physical disability.

He returned immediately to his employer and said, "I'm ready to go back to work."

His employer, to his credit, said, "That's fine. Report down to the barn and be ready to move out."

The business agent of the local union notified the dispatcher that this veteran would have to go to the foot of the list, that he acquired seniority only from that date because he had been in default of the payment of his dues at the time of his induction and technically he was not a member of the union.

The company was operating under a closed-shop contract.

That was an honest difference of opinion at that level. The company was faced with an unpleasant choice. The company could take that veteran back, put him on his old job, which still existed, and say in effect to the local union, "Do your worst." That would have meant that the barn would go down. No good operator desires that.

The management chose just exactly what you would have chosen. It told the veteran to go to the foot of the list. That meant that he couldn't even get local work. He had to go to the platform, loading.

Eventually we got the case. We thought it was a rather clear case where the veteran was entitled to his old job back and we so notified management. Management said, "What can I do?"

The next move obviously was to set up a joint meeting with the local union, which we did, and soon worked out the facts and they were as I have given them to you. As of that moment the veteran was restored to his old seniority, but then we had a nice difference in pay between that of the over-the-road job and a platform loading position. That meant that somebody owed that veteran a sizable bill.

(TURN TO PAGE 112, PLEASE)

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• Today, Gabriel presents an impressive record of achievement. For tomorrow, Gabriel offers a complete, perfected line of Aero-type Hydraulic Shock Absorbers to meet the exacting demands of all types of automotive equipment. Gabriel's enviable war production will continue as long as our armed forces need Gabriel—but a substantial expansion program, now under way, assures ability to satisfy growing demands of civilian motor transportation. • Gabriel engineers are at your service on request without obligation.

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 - Low torsional flexibility
 - High torque strength
- ★ Built to meet the exacting requirements of car and truck makers.

AC SPEEDOMETER CABLES

REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 110)

Again we brought this to the attention of both management and labor and to the credit of both, they pitched right in to adjust the case. They said, "Let us know the day and we will be down there." They also said, "We will meet with you and we will adjust this case"; and that was done.

Had we been dealing in the initial stages with the officials who finally settled the case or had the veteran been dealing with them, it may not have happened.

However, similar cases are going to arise with you. There are going to be cases where there is a man who is not a member of a union. That poses a problem, especially under a closed-shop contract.

In our relationships we are not anti-management, we are not anti-labor; we are pro-veteran.

Now, a suggested solution to that type of case:

Get together with your local union representative. If there is a fair difference of opinion on the case say that you admit that you don't see eye-to-eye. You know that there is a law on the books, that the Congress put it there, that they expect that law to be followed; let's put this man back in his job and submit the case to Selective Service for a determination.

It's much better to do that and avoid the increment of damages which surely arises when the veteran is not placed in his old job than it is to do what was done in the case I have just given you.

Take another problem which will arise to vex management:

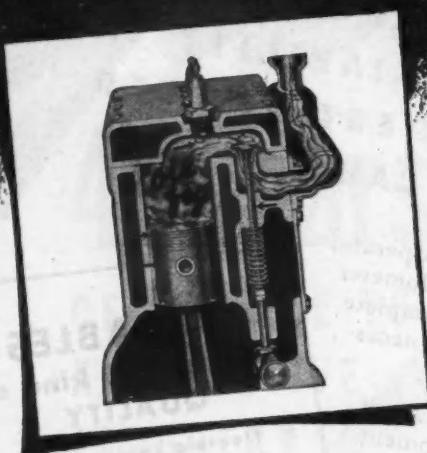
The veteran returns. He had been driving a Mack truck; you now have Internationals; and he says nothing doing, the act gives me my old job back and I want a Mack. That is not as far-fetched as it sounds. We have had veterans who have complained about sitting close to a window because of the draft, saying that they didn't sit there when they went into the service.

In cases of that type we, of course, take a practical view. What we want is to see every veteran employed. We are not looking for lawsuits, we are not looking for the situation that in effect thrusts the veteran down someone's throat for a year, knowing full well that at the end of that year, when the protection afforded him by the Act expires, he will run into trouble of one kind or another.

Now I told you that we had no cases in court. That is true of veterans from Pennsylvania. We have had a very important case arising over in New Jersey. It's the case of KAY vs. THE GENERAL CABLE CORP. It was decided by the Third Circuit Court of Appeals of the United States in Philadelphia and it is indicative of what we believe will be the trend of the judicial decisions. Just a word about the facts in that case to show you how honest differences of opinion may arise.

The veteran there was a company physician. He worked on a salaried basis for this corporation but he also had outside practice. He had great leeway in the hours that he spent at the company and the question there

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**"THIS ONE SHOULDN'T
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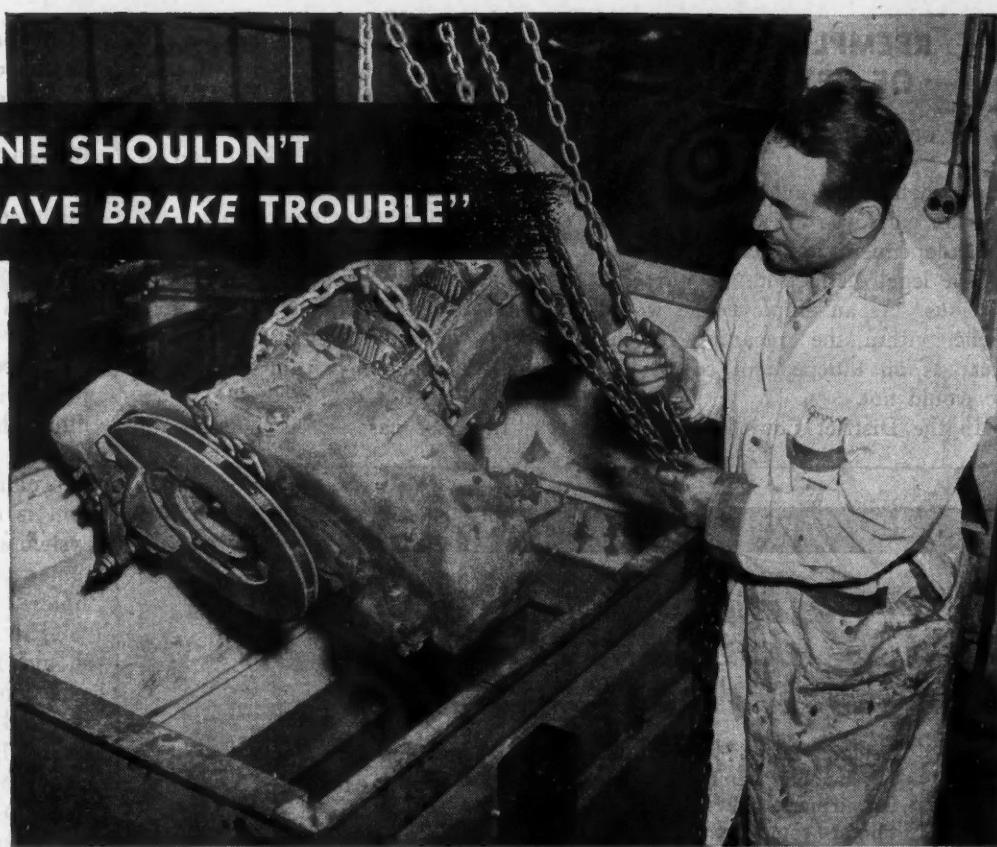


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He can't. But what this man sees, installed at the rear end of that transmission, is a **TRU-STOP Emergency BRAKE** with its ventilated disc. That tells him a lot.

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REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 112)

was whether or not this physician was an employee or whether he was an independent contractor.

The legal distinction, of course, is obvious. As an employee he would come within the meaning of the Act; as an independent contractor, he would not.

In the District Court it was held

that the veteran was an independent contractor and not entitled to his old job. The Circuit Court in Philadelphia reversed that decision and I would like to read to you a part of its language:

"Accepting the defendant's contention that there would be some loss of efficiency and possibly some additional expense involved, more than that is needed to justify refusal to reinstate a person within the protection of the Act.

"In most cases it is possible to

give some reason for the refusal. 'Unreasonable' means more than inconvenient or undesirable. The defendant's argument upon this point, if carried to its necessary conclusion, would defeat the main purpose of the Act and limit its operation to merely capricious or arbitrary refusals.

"Men and women returning from military service find themselves in countless cases in competition for jobs with persons who have been filling them in their absence. Handicapped, as they are bound to be by a prolonged absence, such competition is not part of a fair and just system and the intention was to eliminate it as far as reasonably possible.

"The Act intends that the employee should be restored to his position even though he has been temporarily replaced by a substitute who has been able, either by greater efficiency or a more acceptable personality, to "make it desirable for the employer to make the change a permanent one."

That last sentence is very significant. Let me apply it to your industry.

Suppose you have an assistant manager of a six-car barn who is inducted into the service and during the time he is away your business increases by leaps and bounds.

The veteran comes back. You say, "John, you were a good man. We liked you but you've only had experience with a six-car barn. You can't possibly handle our crews now."

We have had that identical case come up in another industry. It took a great deal of persuasion for that employer to re-hire the veteran.

It may mean a monetary sacrifice for the employer. The new man, the replacement, may be more efficient. The Court so indicated here, but even if that is the case and even if restoring the veteran to his old job means that the employer for a short time is going to take a licking financially, that's just one of the hardships of war.

The veteran has undergone much greater hardship and the least that any of us can do is to give him a break.

I want to say once again that where we have been able to get the

(TURN TO PAGE 116, PLEASE)

"THE ENGINEERS HAVE HAIRY EARS"

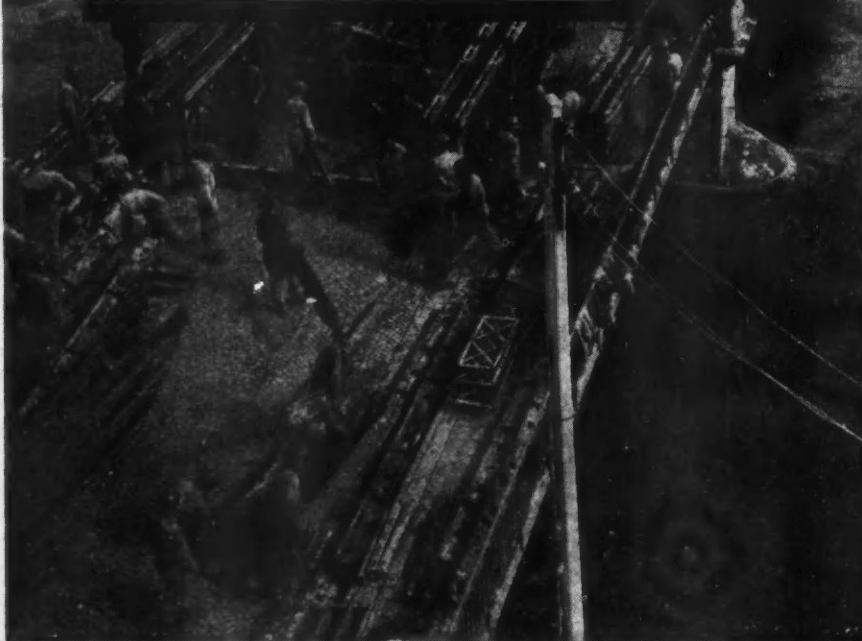
—and a knack for getting things done

Bridging rivers... neutralizing mine fields... handling demolition jobs... constructing airplane runways and providing sanitation are some of the tasks of the COMBAT ENGINEERS.

They've been known to fight all day and work all night... and are just as adept at combat as at ingenious construction jobs.

Any war veteran will tell you, "there are no finer fighting men than the Combat Engineers", and that is praise indeed.

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★ Edwards is making a sincere effort to contribute its small share in helping these troops... and all of the United Nations... with the material they require. Semi-trailers for combat use are, naturally, included.

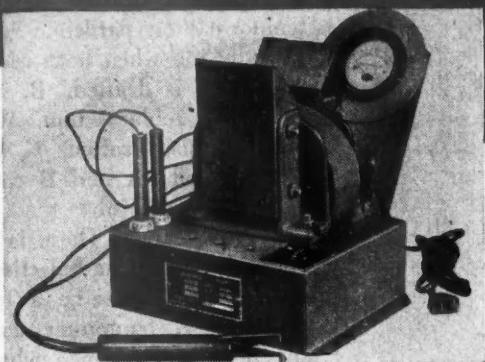
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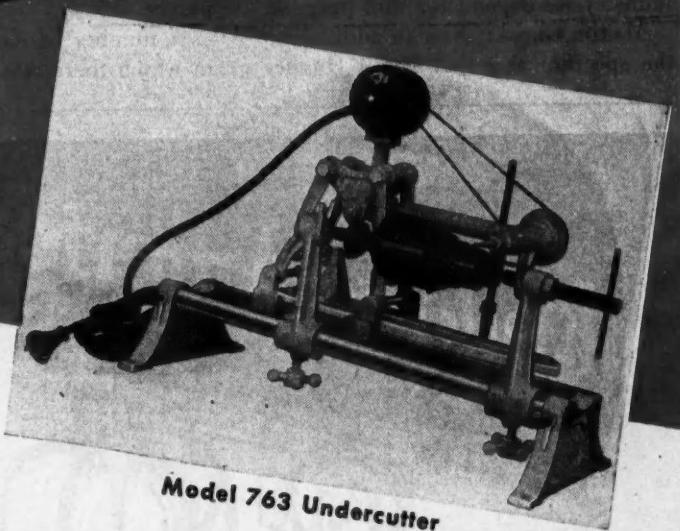
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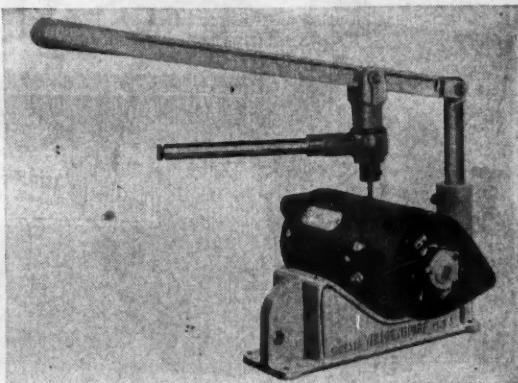
Speed up electrical service with these four pieces of typical equipment in the Weidenhoff B&E line. They'll lick those tough service problems on generators, starting motors, armatures and handle more efficiently those every-day jobs encountered in electrical service.

MODEL 701 GROWLER—Double wound meter type. Indicates defective wiring, nature of defect, location of troubles, etc. Handles armatures not possible in other growlers.

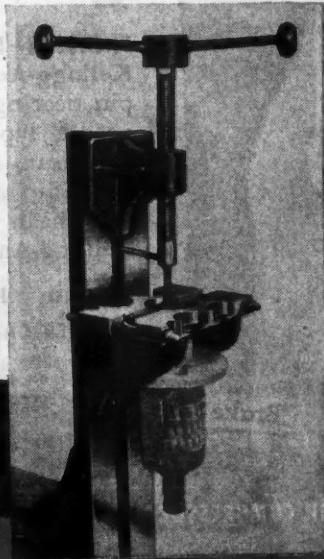
MODEL 763 UNDERCUTTER—Heavy duty type. Undercuts commutators up to 6 in. diameter. Centers adjusted to 18 in. Handles all types armatures.

MODEL 973 POLE PIECE SCREW DRIVER—Instantly removes or replaces pole piece screws without damaging parts. Ratchet handle operates right or left. Ruggedly built for hard service.

MODEL 967 PULLER PRESS—Quick acting arbor and puller press for removing and replacing bearings, bushings, races, caps, slip rings, etc. Saves time and prevents breakage.



Model 973 Pole Piece Screw Driver



Model 967 Puller Press



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CHICAGO 24, ILLINOIS

REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 114)

labor representatives in on these cases we have had excellent cooperation and they have been settled satisfactorily in every instance. Our ultimate objective is a good job for every veteran. On you gentlemen of industry we depend for that purpose.

MAJOR GROSS: Now in addition to the specific cases that Major Hughes

has mentioned there are the various general questions—standard interpretations, daily encountered—which you will meet. Here are some examples:

QUESTION: What constitutes application for employment, written or oral?

MAJOR GROSS: A veteran, to be on the safe side, should write a letter, should go on record to his employer.

A number of cases have come up in which there was some question of

the type of words that a man used in applying for his old job. He went to his foreman and said, "I'll be out in a few days and then I'll come to see you."

What do you think that means?

It is hard to say. There again the intent comes in and the spirit of the Act. If the man has indicated to somebody verbally, personally, over the telephone, that he wants his job back, that is in effect an application for his job; but we recommend that he do it in writing and do it definitely and date it.

QUESTION: Employe was hired to replace a drafted employe on a temporary or part-time basis, who gets the job when both return? Example: A is drafted. B, who is 17 years old, replaces him. When B is 18 he is also drafted. C, a veteran, is employed. A and B come back. Who keeps the job?

MAJOR GROSS: There is one type of employe that the Selective Service says is known to be a temporary employe. A temporary employe is any man and all men who succeed the original, so-called permanent, holder of the job after he volunteered or was inducted or commissioned into the service.

In other words, A is the only regular holder of that job. Any other man who succeeds A in that job is not entitled to return to that job if A comes back and wants that job and takes it.

QUESTION: Are intoxication, working part-time, and failing to return collections causes for discharge under that rule which says a man must be kept in continuous employment of the employer for one year and may not be discharged except for cause?

MAJOR GROSS: Well, let's begin with the last one. If that's one of the ordinarily agreed reasons between the employer and the union in your agreement, that certainly is a reason for discharging a man.

If a man is intoxicated, do you ordinarily discharge him? Under what conditions does he have to be intoxicated? You ought to take into consideration probably why, how and when he was intoxicated. You know that better than I do.

Now, working part-time. You have, certainly, in your industry, a very definite rule about working

(TURN TO PAGE 120, PLEASE)

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FRICTION LOSS is cut to a minimum in Kellogg-American compressors. Wrist pin bearings, for example, are roller, needle type, an exclusive Kellogg-American feature. This, a Kellogg-American extra, is one of the things that mean most air per dollar from Kellogg-American compressors.

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DISTINCTIVE!



Distinctive in color and in quality! That means every re-wire job done with Wiry Joe's new maroon ignition cable looks better—and is better!

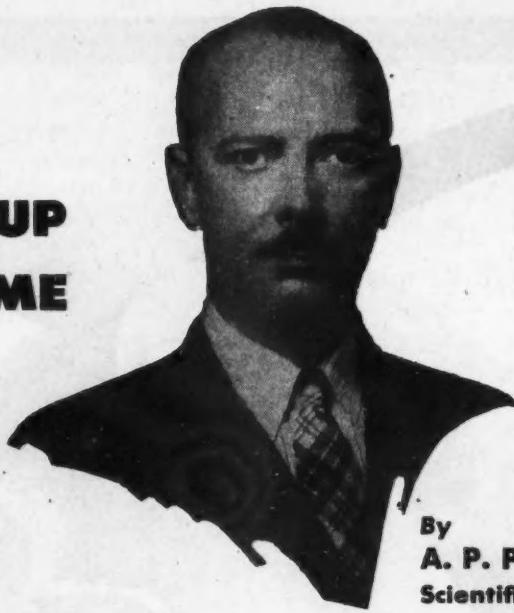
Insulation having outstanding dielectric properties reflects real advances by Wiry Joe in the compounding of synthetic rubber. And Wiry Joe braids are made of soft, combed, or super-carded yarns of first quality—coated as many as twenty-four times with a special lacquer. This means an outer covering that assures maximum protection for the insulation—a covering that is highly resistant to heat, cold, gasoline, oil, grease, moisture, salt air.

Ask your jobber about Wiry Joe's maroon primary and high tension cable—it's the answer to many ignition problems. Look for the announcement of other Wiry Joe innovations soon!

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Check the wire on every job!

SPEEDING-UP BRAKING TIME



By
A. P. PECK, Managing Editor
Scientific American

THE first automobiles had crude braking systems, but in most cases they were ample for the purpose since the chug-chug cars of the early 1900's had little competition on the roads of their day. Soon came the four-wheel brake system and then the hydraulics. But, essentially, tradition was followed despite the obvious need for a still more effective means of stopping cars.

When motor-car production once more gets underway in post-war days and the estimated five-million-new-cars-annually start to roll on our highways, will traffic accidents — the "unavoidable" smacks in stop-and-go traffic and on the open road — climb in like proportion? Or will "power braking," as exemplified by the already available Vacdraulic system, do its part in avoiding these accidents by decreasing the time and distances necessary for stopping cars from a given speed?

In considering the overall subject of motor vehicle braking time — whether truck or passenger car — it must be remembered that two separate and distinct time factors enter the picture. First there is the human reaction time lag between the instant when the driver realizes that he must apply his brakes and the instant when his foot starts to apply enough pressure to the pedal to actuate the braking system. Second, there is the time required for the braking system to bring the car to a stop.

When a vehicle equipped with what are considered today to be "good brakes" is traveling at 30 m.p.h., it will move 33 feet along the highway between the time when the average driver sees trouble ahead and the time when he starts to apply his brakes. But this 33 feet is less than half the story. By the time the vehicle is brought to a full

stop, it will have traveled at least another 47 feet or possibly much more!

Here we have a total of at least 80 feet of travel with a vehicle equipped with good brakes before a stop can be made from 30 m.p.h. And a lot can happen in 80 feet in congested traffic!

The figures just cited might be called "ideal" figures. That is, the human reaction time is what might be expected when the driver is fresh, alert, not tired. But when he has been driving for hours his reaction time will increase and, likewise, the pressure which he can apply quickly to the brake pedal will decrease. In other words, the 80-foot stopping distance at 9 a.m. might increase to 110 feet at 4 p.m. after a long day's drive, but without any change in the braking system.

There is not much that can be done about human reaction time itself, but the increased use of power braking, with its accompanying "feather-touch stopability" can compensate for variations by decreasing materially the time lag in the braking system. That is, if the driver has to apply heavy pressure to the pedal in order to produce the required braking action, the total time required to stop the vehicle is increased. Anything that can be done to decrease the needed pressure will also decrease the distance which the vehicle will travel before coming to a stop.

In the Vacdraulic brake power booster, the effective pressure of the foot is multiplied many times. For example — a 50-pound pressure on the pedal is transmitted as 1000 pounds of braking action. Thus, while the human reaction time is not decreased, the application reaction of the booster more than compensates. This brake power booster has no mechanical connections

to cause an operating lag or to get out of adjustment. It is connected directly in the hydraulic line and to the intake manifold of the engine. Thus it utilizes the vacuum produced by the engine to multiply the power and stopping energy exerted on the brake drums. In this way it gives to any good hydraulic brake an important factor of increased safety and of split-second stopability.

Brake power boosters, with feather-touch pedal action, are becoming increasingly important on our highways as well as in congested city traffic. They enable a 100-pound high-school girl to exert the same braking action as quickly as a husky 200-pound truck driver. And, furthermore, they make it possible for that same truck driver to keep as complete braking control over his vehicle when he is muscle-weary after a long trip as he could exert when he started out fresh in the morning.

The whole problem of motor vehicle braking may be summed up in this manner: A good braking system remains constant in action regardless of time of day or night or of distance traveled; the reaction time of the driver varies over a wide range determined by physical condition, age, fatigue, excitement, and traffic distractions. The faster a brake will produce the required stopability under a light touch of the foot on the pedal, the safer will be the driver despite his changing reaction time.

Because of these facts it seems inevitable that brake power boosters will become standard equipment on passenger cars as well as commercial vehicles of all kinds. Perhaps even more important at the moment is that Vacdraulic power boosters can be applied to any pre-war cars equipped with good hydraulic brakes, providing smoother, safer, faster brake action.



SUB-ZERO CAN'T CHANGE

feather touch **STOPABILITY**

This is a cold fact! There is no booster freeze-up when brakes are Vacdraulic equipped. There is no vacuum piston to freeze. That is important!

Vacdraulic accomplishes its power braking force without action arm and without rods or links. The few moving parts and little friction result in long life without adjustments.

Vacdraulic engineered design permits installation at any convenient place on the car, truck or bus.

The braking action is quick yet smooth and safe.

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MODEL 310**
Heavy Duty
Trucks



**VACDRAULIC
MODEL 240**
Medium Heavy
Trucks

REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 116)

part-time, which you know better than I do, as far as it is your understanding with the union that a man is separated because of it. If that is your rule and if you can't stretch it when he works part-time, then that's a cause.

MAJOR HUGHES: We had a case on withholding collections with a

slightly different twist. It was the case of the veteran who, it was alleged, withheld collections before he was drafted but because of the tight labor market at the time he was not discharged.

He came out of the Army with an honorable discharge and applied for his old job back and the employer refused to hire him saying, "No, you have held out on me."

That case came to us. We took the position that the employer had been willing to overlook the alleged

shortcomings of this veteran before he was drafted, and that the veteran was entitled to his old job back.

QUESTION: If there is an honest difference of opinion and the case goes to court and the veteran wins, first, does the veteran have a choice of back pay dating from the time he made his application, or to a full year's employment from the date of the court's decision?

MAJOR GROSS: He's entitled to both. The law doesn't say that he is entitled to one or the other; he's entitled to both. He is entitled to the back pay as a right that was owing to him prior to his final employment in the position that belonged to him, we say, and he's entitled to the year's tenure of that position unless discharged for cause. The year's employment to come is entirely separate from the question of the back pay owing to the man up to the time of such employment.

MAJOR HUGHES: This question suggests the matter of a cash settlement. There have been a few cases where, because of the employer's changed conditions, it was wholly impossible or unfeasible in his opinion to take the veteran back. For example, an employer had converted to women and they were doing a very satisfactory job and he decided to stay permanently with women employees. He said that if he took the veteran back it would disrupt his organization. As a solution it was proposed that he pay that veteran one year's salary and accept a release of his re-employment rights. That was approved.

QUESTION: Please state the position of the employer of a veteran who is continuously being absent from his duties an average of two to three days per week. Must the employer continue with this veteran for the one-year period?

MAJOR GROSS: Would you give him a break? This question doesn't say why he is absent. I don't know whether he is sick or whether he just lays off; but there again comes the question of what your rules are in your industry as to the limit and as to beyond the limit.

QUESTION: Suppose a number of veterans return who might dislodge old employees high on the seniority list who were not in the service?

MAJOR GROSS: That is a question
(TURN TO PAGE 123, PLEASE)

Elsie is a SUPER-CAL!

In Dallas, Baton Rouge and Oklahoma City, Borden's Trucks are Decorated with Superior Decals!

Elsie rides the Borden trucks, attracting attention, creating good-will. She's colorful, gay, amusing to her public. But to Borden's she's inexpensive, durable, uniform, quick to apply, resistant to weather. If you have ten or more trucks you can save money and still get better looking, longer lasting, quicker-to-apply designs than you probably ever imagined before by using made-to-order Super-Cals on all your trucks!

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REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 120)

that comes up very often and the answer to that is that the Act says that there are four conditions for re-employment in the old job. The first is an honorable discharge; then application within 90 days, the ability to do the job, and the fact that the job was other than temporary. There is nothing said, in other words, in the Act that in any way puts any limitation on who is displaced or in what way.

QUESTION: Does the law include women in the services?

MAJOR GROSS: If a woman has been a part of the armed forces—and the WACS, the WAVES, the SPARS, and the other organizations that are now a part of the armed forces—which fact can be checked on, and if she receives an honorable discharge from the service, she is entitled to the same re-employment rights as a man.

QUESTION: Who decides whether the veteran is able to perform the duties of his old job?

MAJOR GROSS: We ask that the employer give the veteran the opportunity, unless there is an absolute threat of loss of life immediate, that he be given gradually and carefully, if necessary, the right to prove whether or not he is able to perform the duties of that job.

In other words, that no one should arbitrarily say no, he isn't able to do it; but that if possible he should be given a chance and you should give him, if possible, the examination that you give a man coming in from outside to undertake the same job.

QUESTION: Suppose the employer, since the war began, has set more rigid physical standards — hernia, etc.? Suppose a man was employed by a certain company and at the time that he entered the service he had a hernia. When he came back after the service in the armed forces, the company had been sold to another owner, another company; the name had been changed and the new company had put in the requirement that in this particular job where the veteran worked no man with a hernia was allowed to work.

MAJOR GROSS: We say that that

man is entitled to his old job if he had a permanent job with the old company, providing that company has a semblance of doing the same work and having those jobs. In other words, that the whole set-up of the old company was bought by the employer.

We also say that if the veteran was permitted to work by the former employer with a hernia, that he is entitled to return to his old job under the conditions which existed at the time he entered the service.

QUESTION: Suppose the business has been sold and the veteran was never an employee of the present owner?

MAJOR GROSS: Well, he was an employee of the other owner and if the semblance of organization remains the same, the set-up is the same, he is entitled to his job under the new set-up.

QUESTION: What happens if a salesman-driver says it is not his old job if he is not given his former route,

(TURN TO NEXT PAGE, PLEASE)

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FOR THE
LITTLE DRIP!
-or BIG ONES!**

Show no mercy to "drips" of water or oil—enemies of automotive transportation—hampering its vital service—wasting time and money.

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GASKETS
packings + sealing materials

BUY MORE WAR BONDS

REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 123)

where he knew all the people?

MAJOR GROSS: Where a man's job consists largely of the customers or the clients or the people with whom he dealt, if you put him on a run where he knew nobody and where his compensation depends on his ability to sell to those unknown customers, that means that he is not

being restored to his old job of like seniority, status and pay. It certainly is not the same status for a salesman in the Philadelphia territory to be offered the job in the Pittsburgh territory, with customers with whom he had never dealt.

QUESTION: Suppose that if the veteran had been able to stay on the job his status would have improved during his absence?

MAJOR GROSS: If that job was automatically increased in compensation due to a general upgrading of

that type of work, he is entitled to that increase in pay. He is also subject to a decrease in pay if every other similar worker has been similarly cut.

If the upgrading in his job was a skill-acquired upgrading, the veteran could only have acquired that skill if he had stayed in the service of his employer. Therefore, a skill-upgrading is not required. The employer is not to give the man necessarily a skill upgrading, where his experience was absolutely necessary to getting that additional pay.

QUESTION: What if the number of employees has been reduced and all present men are senior to the returning veteran?

MAJOR GROSS: If the man had a so-called permanent job and his old job or that equivalent job is there, there is nothing said about whom he displaces. He is entitled, under the Act, to his old job or a job of like seniority, status and pay.

The employer must give the veteran his old job or a like job unless it is impossible or unreasonable. It has been said that this does not mean inconvenient.

QUESTION: I understand that a veteran is entitled to *schooling* or *training* under your program in a plant. Does this mean training such as mechanic in trucker's garage? How does an employer get the right to train, and how much can the man be paid while learning?

MR. TALMON: It's possible to train a man on a job or what we call apprenticeship training either under Public 16, the disabled veterans' act, or under Public 346, the GI bill. However, we have this difference:

Under Public 16, the disabled veterans' act, we have up to four years to train a man under an apprenticeship program. We pay him while he is in training—\$92 a month if he is single, \$103.50 if he is married, \$5.75 for each child, and \$11.50 for each dependent parent. Whatever is the time required to complete a training program, that is how much time he will get.

Under Public 346 we can carry him only for the time that he is entitled to and if he is 25 years or under, and has only 26 months of training with subsistence coming to him, that's all the longer we can carry him.

(TURN TO PAGE 126, PLEASE)



• ATTRACTIVE • ECONOMICAL • PROTECTION

FEATURES

Tanks and Tool Box of 12-gauge steel, electrically welded.

Non-siphon baffles make tanks pilfer-proof.

Curved angle iron suspension gives greater road clearance.

Non-spillable cap when tank is in overturned position.

Mounted without drilling any holes in truck frame.

Prior Tanks are sold through distributors and dealers.

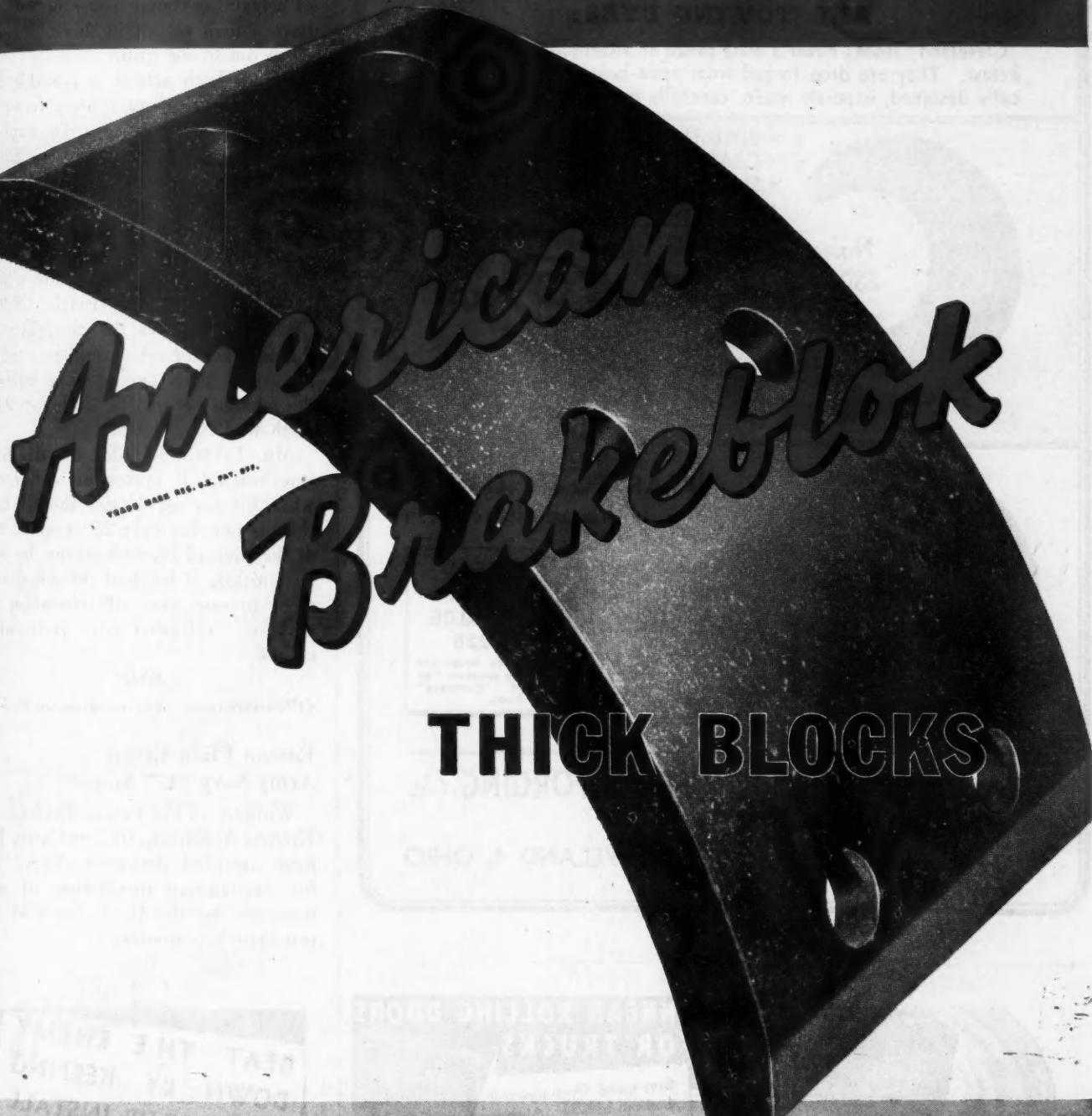
WIRE OR WRITE FOR NAME OF NEAREST DEALER

CCJ

PRIOR PRODUCTS

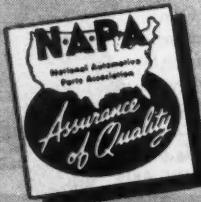
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"American Brakebloc engineers maintain the Free Advisory Service to help you with tough brake material problems."



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Brake Shoe
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"Cleveland" Hooks cover a wide range of adaptability. Note list below. They are drop-forged from open-hearth steel, scientifically designed, expertly made, carefully inspected.

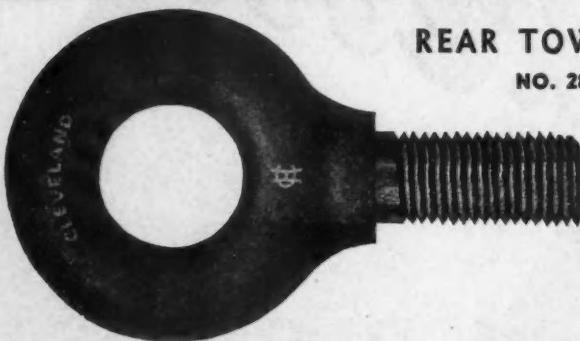


No.
2800

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- GRAB
- SNAP
- SLIP
- SPREADER CHAIN
- TOWING

FOR BIG JOBS

*Drop Forged and Heat
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NO. 2805 ILLUSTRATED

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the complete line
of "Cleveland" Irons.

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BATTERIES
built for REPLACEMENT SERVICE
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Save space! Open upward!
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safe from wind. Can't
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FOR BUILDINGS — the recognized leader

REEMPLOYMENT OF VETERANS

(CONTINUED FROM PAGE 124)

If you have opportunities to train men, let the Veterans Administration, or the U.S.E.S., know about it because then we will probably have one of our training officers to come out to see you, to see what kind of a shop you have, to see what kind of a training-course you offer. If we have a man to put in there, we will come out to see you.

Under both acts it is possible for the veteran to draw money from us and from the employer. To explain it more in detail, if a job pays \$200, say a journeyman's rate, we can pay that veteran \$92 or \$50, according to whichever act he is in training under; and you can pay him whatever the graduated scale up to the point where the combined money reaches \$200.

QUESTION: Does the eligibility of the veteran for education and training apply to a person who entered the service before his 26th or 25th birthday?

MR. TALMON: Under the disabled veterans act it makes no difference what his age is. Under the GI bill, if he is one day over 25 years of age at the time of his enlistment, he will be entitled, if he had 90 days' service, to one year of education or training, refresher or re-training course.

END

(Please resume your reading on P. 58)

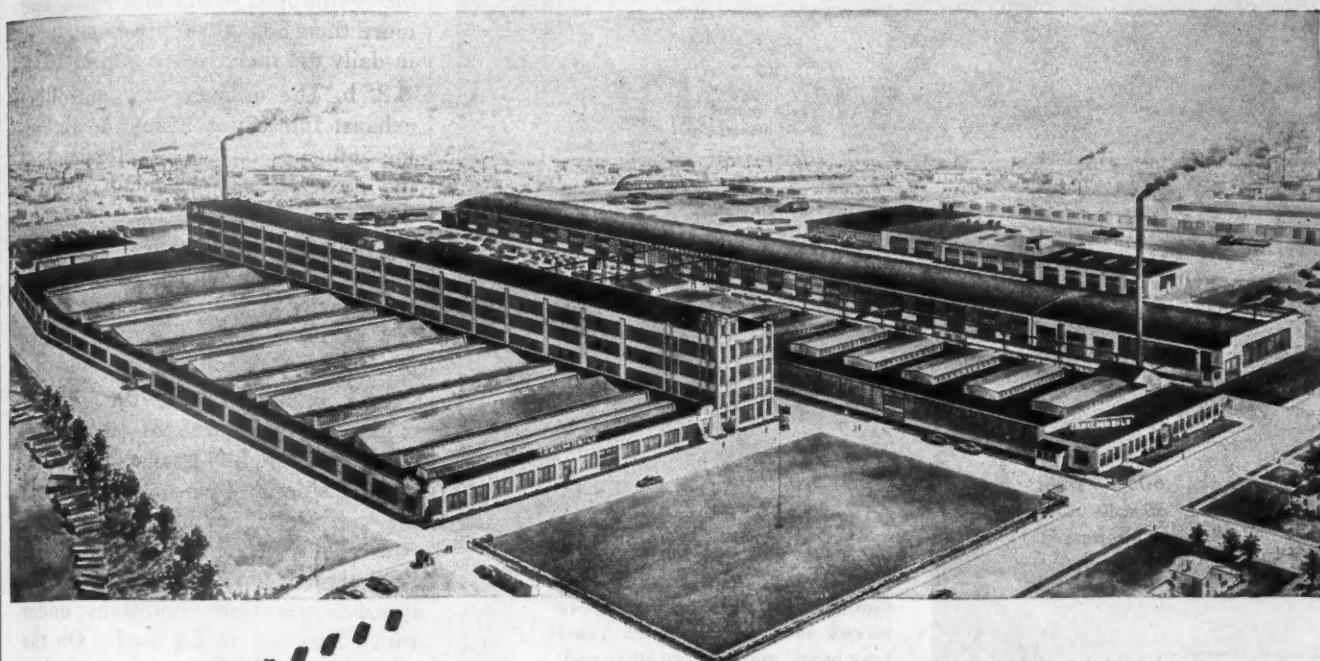
Edison Plant Given Army-Navy "E" Award

Workers of the Emark Division of Thomas A. Edison, Inc., at Cairo, Ill., were awarded the Army-Navy "E" for outstanding production of war materials for the U. S. Navy at appropriate ceremonies.

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DOWN BY KEEPING
THE CARS UP, INSTALL
ENGINEERED PARTS

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A great, modern headquarters plant (shown above) and well-equipped branch factories at Berkeley, California and Charlotte, North Carolina.



TWO Modern production facilities and methods—second to none in the industry—for turning out tough, low-cost-per-mile trailers.



THREE A seasoned, resourceful engineering staff which includes some of the best minds in the business . . . backed up by a highly-skilled production organization.



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A nation-wide network of Service centers . . . 55 of them strategically located and equipped to give fast, expert repair and maintenance service on all makes of trailers. Ask for an up-to-date list.

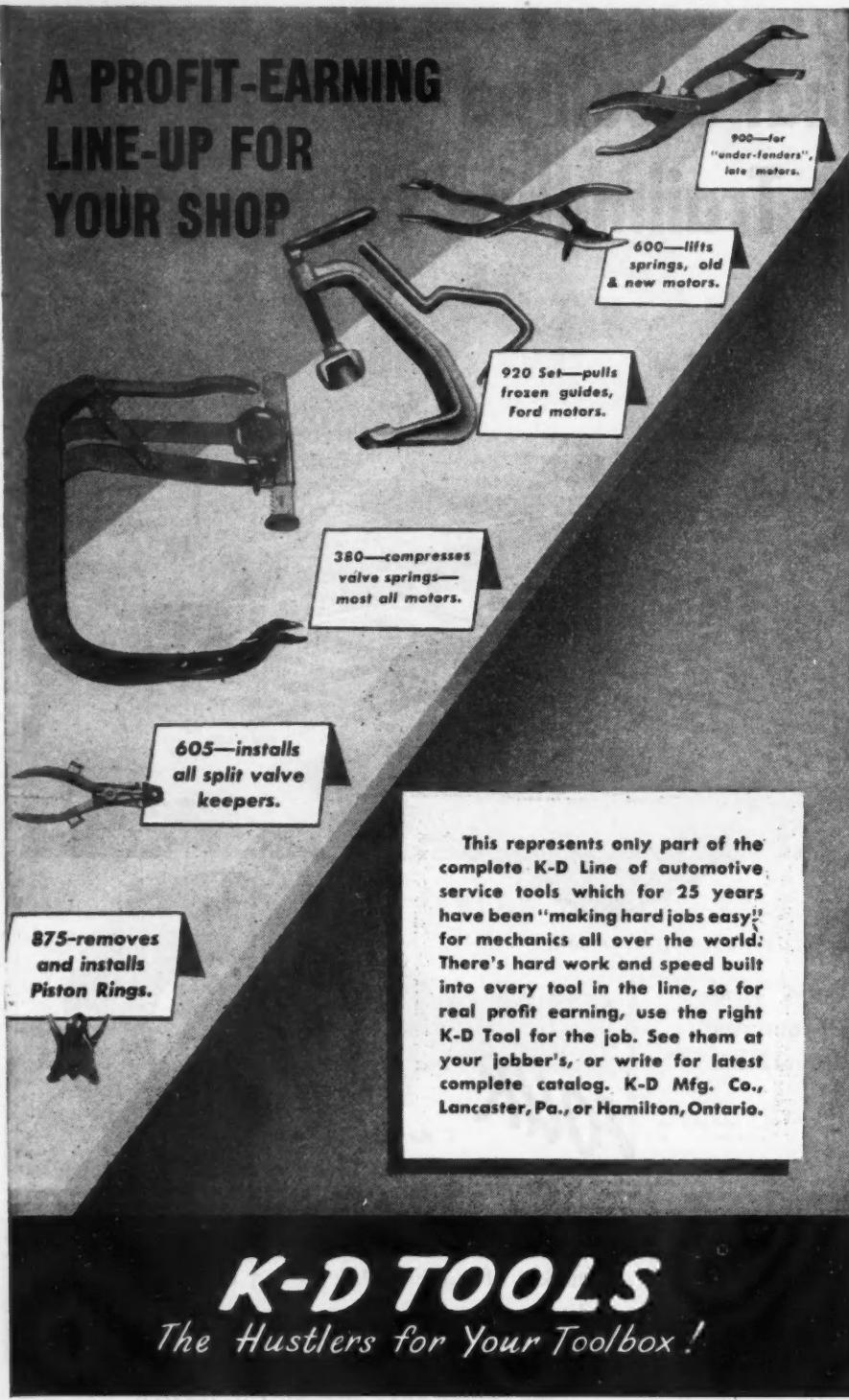
The Trailmobile Company, Cincinnati 9, Ohio; Berkeley 2, California; Charlotte, North Carolina. Branches in principal cities.

TRAILMOBILE

Commercial Trailers for War and Peace

The Vital Link in Flexible Transportation

A PROFIT-EARNING LINE-UP FOR YOUR SHOP



QUIZ ANSWERS

CCJ Quiz on Page 82

1. d. Diesel truck engines began to appear about 1933. The first installations were made by the operators themselves. Progress in this country, though, lagged behind Europe. Germany, as early as 1929, had 540 diesel-equipped trucks and buses, and more than 30,000 such vehicles were in daily use there by the end of 1934.

2. b. The difficulty of controlling exhaust fumes was a definite retarding influence on the development of the early diesels. A cloud of black smoke following a truck down the highway marked it as a diesel. This, however, is no longer true, as improvements in the combustion chamber, piston and injection system have provided better control.

3. a, c, and e favor the gasoline engine; b and d the diesel. Diesel engines are slightly heavier in weight, cost considerably more. They haven't the inherent flexibility of gasoline equivalents, necessitating that diesels be designed more extensively for the specific operating conditions under which they are to be used. On the other hand, diesels operate on a less expensive fuel and use fewer pounds of fuel per horsepower produced.

4. a. False. Dr. Diesel mysteriously disappeared from shipboard in 1913, while crossing the English Channel.

b. False. Dr. Diesel gained fame and fortune from his engine. It was his invention that made the submarine practical.

c. False.

d. True. It was von Linde's description of the low efficiency of the steam engine that led Diesel to develop a better engine.

e. False.

5. a. True.

b. False. Although a gasoline engine drops in efficiency with reduced speed, the diesel engine actually increases its efficiency.

c. False. Many are two-cycle.

d. True.

e. False. There have always been more trucks, and the use of diesels has grown more rapidly in the truck field recently than in buses.

6. a. The West Coast. Hilly conditions and long hauls emphasize fuel economy, so that the largest users of

(TURN TO PAGE 130, PLEASE)

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Be
100%
With
10%
Buy
War
Bonds



PAT.
PEND.

RUGGED

Built to 'take it' when the going is toughest

The march to Victory is becoming a reality only because myriads of rugged spark plugs kindle everlastingly throbbing power and movement in the engines of war. After months of ceaseless service, rugged BLUE CROWN Spark Plugs still fire the motors of transport and combat. On the beaches of Normandy, over the mountains of Italy, across the sands of Africa, only the rugged can prevail.

BLUE CROWNS... built for rugged relentless service wherever the Nation calls, whether at home or abroad, can stand up and "take it" when the going is toughest. They are precise, efficient, dependable... and above all, RUGGED.

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HUSKY Controlled Heat Zone SPARK PLUGS



A BLUE CROWN FOR EVERY PURPOSE IN PEACE AND WAR

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BUY MORE
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MEMO

To: Fleet Operators
SUBJECT: Preventative Maintenance

Install HANDY GOVERNORS on All Vehicles

SAVE 32% on engine repair

SAVE 26% on lubricant costs

SAVE 23% on tire maintenance

SAVE 15% on fuel

SAVE 37% on accident costs

SAVE 30% on brake maintenance



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MANUFACTURERS OF THE FAMOUS HANDY, HANDY VARI-SPEED AND HANDY VISIBLE ACTION GOVERNORS

COMPACTNESS DURABILITY SIMPLICITY ECONOMY

Precision Built
INTO EVERY MARVEL-SCHEBLER CARBURETER

MARVEL-SCHEBLER CARBURETER DIV.
BORG-WARNER CORP.
FLINT 2, MICHIGAN

(CONTINUED FROM PAGE 128)

diesel engines have been operators on the West Coast. In the early 30's a small number of diesels were already in service there, and many new developments have been worked out from operations in that area.

7. a, e, and f. The carburetor and ignition system, including the spark plugs, are not needed on a diesel engine. There is no spark ignition of a fuel and air mixture in a diesel engine. Instead, the fuel and air are mixed inside the cylinder itself, and ignition is accomplished by the heat of compressed air.

8. c. Air in the cylinder is compressed as much as 16 times, heating it to about 1000 deg. Fahr., which is the temperature of red hot iron. This extreme heat is sufficient to ignite the fuel oil when it is injected into the cylinder.

9. d. Nine miles deep in the sea the water pressure would be 20,000 lbs. per square inch . . . and there is no point on the globe where the sea reaches such a depth. Greatest ocean depth, near the Island of Mindanao in the Philippines is less than 7 miles. Under such tremendous pressure, the oil becomes a fine fog-like spray.

10. "Gasoline Engine."
- Compression of mixture of air and fuel
 - Carburetor
 - Electric ignition
 - Compression ratio of 6 to 1
 - Uniform temperatures within the cylinder
- "Diesel Engine."
- Compression of air only
 - Compression ignition
 - Fuel injector
 - Compression ratio of 16 to 1
 - Varying temperatures within the cylinder

GASOLINE *Sterling* DIESEL
HEAVY DUTY MOTOR TRUCKS

For more than 37 years Sterling has been building quality motor trucks. They are distinctively rugged trucks, engineered and built to haul heavy loads economically and at more profitable speeds.

Specific heavy duty four and six wheel models are offered for highway transportation, mining, quarrying, logging, stripping, excavating, etc.

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Here's the all-time high in a primer-surfacer. Ditzler PS-67 has amazing adhesion quality, is a true rust inhibitor, fills so well that it can be used with minimum preparation of surface. It exhibits no shrinkage and is easy to sand wet or dry. Its perfect hold-out insures full retention of lustre. Overnight drying is recommended but it can be worked over much sooner. PS-67, despite its unusual character carries no premium price. It's available now. Why not get a trial supply from your Ditzler jobber and prove it for yourself?

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- ★ EXCELLENT ADHESION
RUST INHIBITOR
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SANDS WET OR DRY
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DARK RED OXIDE
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NO PRICE PREMIUM

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Cable and
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ASSEMBLIES

**6 KITS
ELIMINATE
STOCKING
179
STANDARD
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ASSEMBLIES
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Hygrade's Speedometer set-up includes ready made cables and casings, also parts and tools to make your own assemblies.



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REPLACEMENT PARTS
for
FUEL PUMPS
CARBURETORS
SPEEDOMETERS
SHOCK ABSORBERS
FUEL LINES
AND FITTINGS

GRIPER DEPARTMENT

(CONTINUED FROM PAGE 53)

There are, of course, several methods for extracting broken studs. Not the least of these is the one using the arc welder and old nuts. The arc welder, however, is used by many truck owners in this locality for a more permanent cure by welding the flange solidly to the hub. This, of course, is not without drawbacks that quickly manifest themselves in the case of a broken axle.

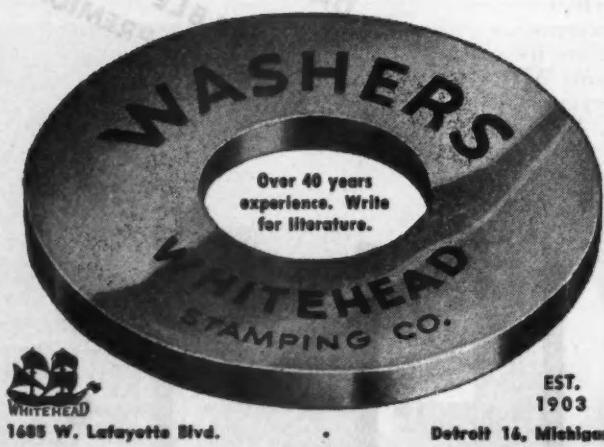
Any of these expedients will do in a pinch; must do, in fact, until something better shows up. But they effect only the results and leave the cause untouched. Besides, they are frank admissions that profound weaknesses in design do exist.

The question of what is and what is not a full floating axle could, I suppose, become highly argumentative. But so long as an axle flange is designed to be tightly affixed to the hub, just so long will it fail to be full-floating.

All the objections cited in the foregoing, along with a few that might be pointed out in past styles of genuine full-floating axles, could be overcome by an unadulterated version embodying the features illustrated in the sketch shown on p. 53. This design calls for a hub broached to a scalloped shape inside to receive, by press fit, a heavy hardened steel bushing with scalloped surfaces outside and in. The inner surface to receive the scalloped flange of the axle shaft.

The length of the bushing should be about three times the thickness of the flange to insure sufficient bearing surface against the hub material. The

(TURN TO PAGE 134, PLEASE)



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**HYDRAULIC
BRAKE FLUIDS**

- Commercial car maintenance men who know brakes best, specify FLARE HYDRAULIC BRAKE FLUIDS . . . blend perfectly with all original equipment and other first quality brake fluids.
- Laboratory and highway tests prove FLARE is tops in quality. Available in flat type and shop size cans.
- Ask your wholesaler, or write.

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1858 W. KINZIE STREET, CHICAGO, ILL.
ESTABLISHED 1920

Cylinder life multiplied by 5



Cylinder life that is multiplied by 5 is the experience of a large city bus company who made the comparison between PORUS-KROME cylinders and ordinary cylinders in the same engines.

The reason that cylinders last longer when they have been treated with PORUS-KROME, applied by the Van der Horst process, is that it resists wear and corrosion better than any other known cylinder material.

PORUS-KROME is pure, hard chromium which has been processed so that there are myriads of tiny pores and channels in its sur-

face. These pores and channels serve as reservoirs which hold lubricating oil and feed it back to the cylinder surface as needed. Better lubrication, plus the fact that chromium is so much harder than iron or steel, reduces wear to a minimum. Field tests have shown that PORUS-KROME multiplies cylinder life from four to twenty times . . . depending on the size and type of engine.

If you are a builder or a user of engines . . . gasoline or Diesel . . . you will profit by specifying PORUS-KROME. Write for complete information today.

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Moguloid

A Shop-Proven Process
For the Positive Repair
Of Cracked Motor Blocks



HERE'S THE EQUIPMENT YOU NEED

There is absolutely no guesswork in motor block repair with this time-saving, proven, new Moguloid process which basically employs the Mogul Electric Bonder—an air-cooled unit for electric bonding the crack. It is fast and easy to use. Nickel rod is used for cast iron blocks and aluminum rod for aluminum heads and blocks.



MOGULOID TEST HEAD — With the electric bonding technique or any mechanical method of block repair it is recommended that a Moguloid Test Head be used to test for possible pin hole leaks. These heads are also invaluable for testing seepage, after sleeves have been in-

stalled or when water is found in the oil reservoir. No shop should be without these fool-proof, time-saving test heads. Available for all makes and models of auto, bus and truck. Moguloid Test Heads are lightweight, cast aluminum and equipped with pressure gauge and air connector.

MOGULOID SOLUTION — Here is a pure colloidal that is excellent for sealing a leak in the block, stop a leak in the radiator, head or water pump. Shops doing mechanical block repair will find Moguloid the solution for closing pinhole leaks in the repair. Every bus and truck should carry a bottle for emergency repairs on the road.

Write for New Moguloid Bulletin No. 22 on Cracked block repair.



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In complete sets of Signal-Stats or as a replacement switch—ASK YOUR JOBBER

SIGNAL-STAT CORPORATION
68 JAY STREET BROOKLYN, N. Y.

GRIPE DEPARTMENT

(CONTINUED FROM PAGE 132)

hub should be threaded on the outside to take a heavy hub cap that would, with the aid of a spring, hold the axle in place longitudinally.

EARL V. N. LEAVITT,
Mechanic, Lake County
Road Commission,
Baldwin, Mich.

Stronger Construction And Better Accessories

THE GRIPE DEPARTMENT,
DEAR SIRS:

I would like to add a few gripes to what has already been heard. Why do manufacturers

build their trucks for appearance only to have someone back into it after a short time in service? Why not have a good, strong, factory-built guard on the front of all trucks? The small additional cost would repay itself many times over in time saved replacing grilles, headlamps and other parts, besides saving the cost of the parts themselves and the time that the truck is laid up for these repairs.

Why not have a good rear-view mirror bracket built for the truck, that would trip either front or back when getting caught on garage doors, instead of the cheap, hinged mounting bracket we now have.

We also should have stronger door checks, and easily replaced door lock springs instead of replacing entire lock which we must do on some makes.

On front doors the lower hinge keeps breaking out of door. This part should be more strongly built to

(TURN TO PAGE 136, PLEASE)

The A B C's of Wheel Alignment Testing

Send for this Free Book that gives in illustrated form the fundamentals of wheel alignment testing. It takes the mystery out of wheel alignment!

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A large percentage of America's buses, carrying millions of passengers over millions of miles of city and country highways, is equipped with Spicer Products. Spicer Transmissions, Torque Converters, Clutches, Propeller Shafts, Universal Joints and Axles have established an exceptional record of performance in serving America during both peace and war. Spicer Manufacturing Corporation, Toledo, Ohio.

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Flexible Clipper



KENWORTH



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Southern Coach And Body Company



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General Motors Coaches

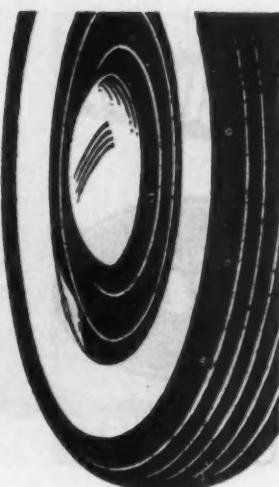
Expendable- MATERIEL, OR MEN?

OUR military leaders are calling for "more of everything" needed to finish the war quickly . . . at the lowest cost in casualties. The more we expend in supplies, equipment and ammunition, the less we will have to expend in *human sacrifice*.

Here at Fulton we have answered the call by devoting our entire resources and facilities to increased, uninterrupted war production. Not a single day nor hour has been lost at the Fulton plant through labor controversies. Each worker feels his or her responsibility and is pledged to help finish the grim task before us. There can be no letdown!

The most and best we can give here on the Home Front is insignificant, by comparison, with the *Service and Sacrifice* of our men on the Battle Fronts . . . and yet, it is vitally important. They can't do their job without the full support of the *people and industries "back home"*.

THE FULTON CO. 1912 South 82nd Street
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TRUCKS • BUSES • PASS. CARS

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WEST COAST DIS.
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LOS ANGELES 15, CALIF.

GRYPE DEPARTMENT

(CONTINUED FROM PAGE 134)

save time and the trouble it takes to make a good repair at this point.

Seat cushions should be built of stronger materials and better construction. We have to rebuild these units after about 6 months of use.

Also on panel delivery trucks, the rear door frame and body is not strong enough. A little heavier metal and better reinforcing plus better welding at these points would save the time it takes to rebuild this part of body after a year or less of service.

Why not discontinue the use of the troublesome cable controlled parking brake? How about relocating the battery to an under the hood spot instead of having to chisel it out from under the floor boards? Why not a good horn on the trucks, at least to match passenger car horns or better, instead of the cheap peep peep we have been getting with our trucks.

Also, all trucks, as a safety feature, should come with two windshield wipers of good quality, preferably electric.

Well, I got this off my mind, even if it don't get put to use.

JOE WALENTA,
Chg. Maintenance Merchants Delivery
Moving & Storage Co.,
Racine, Wis.

Flywheel Housing Removal

THE GRYPE DEPARTMENT,
DEAR SIRS:

I enjoy reading your "Gripe" section and I have often wondered how and why the engineers could draw fancy salaries for

(TURN TO PAGE 138, PLEASE)

\$10



MR. TRUCK OWNER:

ALMETAL JOBBERS CAN SOLVE YOUR UNIVERSAL JOINT AND DRIVE SHAFT PROBLEMS. CONSULT THEM FOR HELPFUL ASSISTANCE. *

THE ALMETAL UNIVERSAL JOINT CO.

1555 EAST 55th STREET • CLEVELAND 3, OHIO

THE MOTOR TRADE JOURNAL

APRIL 1942
MOTOR TRADE JOURNAL

Do it right with

SIOUX

Perfected Dual Action

Valve Seat Grinder
with BALL-BEARING Holder



SIOUX offers the most accurate, fastest and smoothest method of grinding valve seats with a uniform fine finish all the way around. Grinds the hardest seats quickly. Perfected dual action provides a controlled fine vibration for grinding accuracy and dispersion of cuttings—wheel mounted for full valve seat contact.

For absolutely correct alignment, use SIOUX Tapered or Tapered Expanding Pilots.

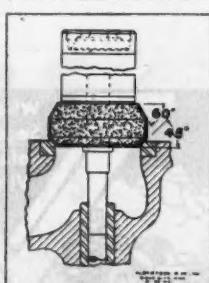
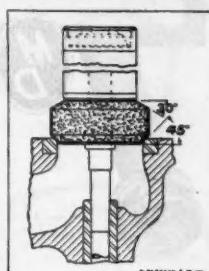
ASK YOUR JOBBER'S SALESMAN

STANDARD THE
ALBERTSON & CO., INC.



SIOUX Valve Seat Grinding Wheels Offer Double Service

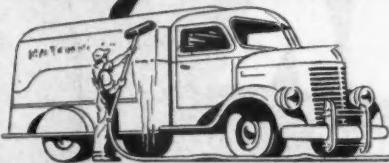
They come in 45° or 30° and are reversible on the Holder. If one side becomes worn, the grinding wheel can be turned over and dressed down to the required angle on the other side. The 45° wheel can be turned over and dressed to 30° or 60° on the dressing tool—providing for top cut and inside narrowing or for 30° seats without buying extra grinding wheels.



WORLD OVER

SIOUX CITY, IOWA, U.S.A.

SPEED WASH FOUNTAIN BRUSH



Washing trucks and trailers with Speed Wash gets amazing results with little effort and great speed. Clean, fresh water feeds right through the handle and tufts, so that each 12 inch stroke does a complete job of soaking, scrubbing and rinsing. There's no waste motion changing tools and back-tracking over the same surface. You can see how this easily cuts washing work and time in half, does a better job, and also saves the finish.

FULLY GUARANTEED

Put Speed Wash to work on your trucks. If it doesn't measure up to your expectations, return it for a full refund of your money. Order on this liberal basis today. Extend your priority of AA-5 or better, to insure prompt shipment. Make out your check or money order to Milwaukee Dustless Brush Co.

9⁴⁵
post paid if
check or
money order.



"Dustless"—"Speed Sweep"—"Speed Wash"—brushes

Milwaukee Dustless BRUSH COMPANY

526 NORTH 22nd STREET, MILWAUKEE 3, WISCONSIN

Where
Secure
Seals Are
Vital

VICTOR
GASKETS, OIL SEALS
GREASE RETAINERS

HOLLAND
Improved
Landing Gear

Load Lifting power unequalled by any other type. 6' more ground clearance than other types. Fast, easy operation. SAFE — SIMPLE DURABLE

HOLLAND HITCH COMPANY
HOLLAND, MICHIGAN, U.S.A.

GRIPER DEPARTMENT

(CONTINUED FROM PAGE 136)

making the blunders and mistakes they do.

My pet gripe is about a popular truck in the higher price bracket.

In order to remove the bell or flywheel housing—in addition to removing the driveshaft and transmission—(now comes the pay-off)—you have to drop the oil pan, pull the rear main bearing cap, drive out the flywheel bolts, then take the flywheel out after you have taken off another pan from the bottom of the bell housing.

Then, and then only, can you get to the bolts and cap screws that hold the bell housing to the motor block.

Isn't that a daisy?

JAMES L. KEENAN,
Keenan Bros. Inc.,
Steubenville, Ohio.

Tougher and Tougher Maintenance

THE GRIPER DEPARTMENT,
DEAR SIRS:

Have worked in this same shop for better than 20 years and have watched the cars and trucks improve in size, power and beauty—at each stage getting tougher and tougher to work on. Engineers should take a course in a large repair shop and get acquainted with the acrobatic performance we mechanics must go through in order to reach some of the units on these beautiful designs.

\$10
▼

One manufacturer says tappets should be adjusted while engine is hot and running, but you can't as much as see the rear tappet till you remove the manifold.

Then we have a battery situation—the type under the floor. Here we (TURN TO PAGE 141, PLEASE)

INSTALL Bowman PLASTIC LENSES

And permanently solve your problem of lenses for all round type marker lamps—
6 sizes, $2\frac{1}{2}$ to $8\frac{1}{2}$. BOWMANs are your best bet for they're SHATTER PROOF • FLEXIBLE • COLOR FAST • WEATHER PROOF • ECONOMICAL.

They have glass like transparency, are not affected by temperature changes—made in two colors, red and amber.

Contact your Jobber or write us direct.
BOWMAN AUTOMOTIVE PLASTICS COMPANY
4316 W. 192nd Street, Cleveland 16, Ohio



GRIPER DEPARTMENT

(CONTINUED FROM PAGE 138)

have a metal floor bolted down with seven countersunk screws. After a period of time and wet weather these screws become rusted so bad that nothing short of drilling them out will get the floor loose. These floor boards have a hole over the battery but just two inches each way too small to lift the battery out. We changed this to small cap screws and enlarged the hole so the battery can be lifted out without removing the floor.

Then we have motors with the timing hole beneath the starter, a small hole about $1\frac{1}{2}$ in. You have to stand on your head to see the marks, these could be at the top at the housing and easily seen.

Then we find on some equipment that the master hydraulic brake cylinder is located in such a position that the only way to fill it is to get underneath and fill by guess. You can't get at it even if you took the floor board up.

We have a number of light pick-up trucks with gas tank under rear end. When something goes wrong with the gas gage unit, you cut a hole in the floor in order to disconnect the gas line and wire. The connections are so close to the floor you can't get in; besides they have the tank set in be-

tween two cross members, which adds to the difficulty. I have tried to take the tank down far enough to be able to reach in and, each time, by pulling down on the line I break the soldered connection loose at the tank.

Another joker is the steel cab doors with a small hole at the middle. It's not that you can't put in a new glass, but when the channel material in which the window slides up and down has to be renewed, this channel felt or rubber starts at one side and ends

on the other. It is fastened in place with small clamps that snap in a number of holes in the metal sides and top of door. There isn't room enough to get your hand in so you can do any work, the only place you can see is through the glass slot at center of door.

W.M. HARSTE,
Sam David Garage,
Toledo, Ohio.

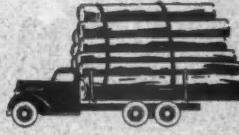
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(Please resume your reading on P. 54)

100% MORE PAYLOAD!



8-4 TONS PAYLOAD
BEFORE CONVERSION



9-10 TONS PAYLOAD
AFTER CONVERSION

THORNTON Four-Rear-Wheel Drives convert medium trucks into rugged 6-wheel heavy-duty trucks.

THORNTON TANDEM CO.
8735-B GRINNELL AVE.
DETROIT 13, MICH.

COURAGEOUS MEN - *Superb EQUIPMENT*



Defense of liberty and country
brings out the finest qualities
of men and equipment. Blood
Brothers Machine Company
takes pride in the performance
of their products in Army and
Navy mechanized equipment.



BLOOD
BROTHERS
UNIVERSAL JOINTS

FOR EVERY NEED OF POWER THROUGH ANGULARITY

BLOOD BROTHERS MACHINE CO.

ALLEGAN, MICHIGAN

DIV. STANDARD STEEL SPRING CO.

THE NEW PRODUCTS

(CONTINUED FROM PAGE 61)

consisting of one compact unit. This hydraulic feed with a pressure of 100 lbs. per sq. in. operates in either direction and may be regulated by adjusting a needle valve.

The boring bar is of hardened steel, and the cutter is set automatically to the desired size by pushing the micrometer down as far as it goes, thus eliminating the human touch or feel.

Use Free Postcard For More Details.

P12. Ignition Seal Liquid

The Radiator Specialty Co., Charlotte, N. C., announces an improved ignition seal for the renewal and protection of electrical systems.

The liquid is painted on all parts of the electrical system and, according to the manufacturer, stops all leakage of electricity. It dries quickly and is not affected by heat or cold. It is simple to apply. Each bottle is equipped with its own brush and carries full instructions for its use.

Use Free Postcard For More Details.

P13. Ointment for Burns

The Davis Emergency Equipment Co., Newark, N. J., has developed a

(TURN TO PAGE 144, PLEASE)



FITS OVER 100 DIFFERENT HOSE SIZES

• The Wolverine of the North Woods is a little fellow, but he can lick almost any size animal. The *Central UNIVERSAL Hose Clamp* likewise is able to take on any size—for just one size in the *UNIVERSAL* fits over a hundred different hose sizes. (The standard length, for example, fits any hose from 1" to 3" O.D.)

Thus the *UNIVERSAL* eliminates the need for different size hose clamps; reduces clamp inventory; assures having right size on hand at all times. And it's easiest to use in hard-to-get-at places . . . has fastest clamping action; goes on or off in a jiffy, without disconnecting the hose line; can't strip or loosen; is leakproof, rust-proof, self-locking; can be used over and over again; has plenty of take-up, even on synthetic hose.

SEND FOR

FREE
SAMPLE

No. 45-2C

CENTRAL EQUIPMENT CO. 900 S. WABASH AVE.
CHICAGO 5, ILLINOIS

Specify
Claw
Double-Duty
TRUCK CHAINS
Columbus McKinnon Chain
CORPORATION
TONAWANDA, N. Y.

LIPE

HEAVY-DUTY Clutches

Insure Maximum Clutch Life

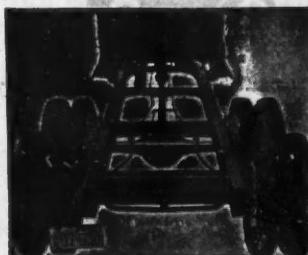
- ★ 30 ball-hinged levers for uniform pressure, smooth engagements, easy disengagements.
- ★ Parallel disc contact. ★ No localized burning. ★ Long facing life.
- ★ Warp-resisting pressure plate.
- ★ Rigid cast iron construction. ★ Forced journal air cooling.

Write for Full Information
Lipe-Roffey Corporation
Syracuse, N. Y., U. S. A.

LITTLE GIANT
AUTOMOTIVE TRUCK EQUIPMENT

TEN WHEELERS

for 1½ to 8 Ton Trucks



Greater tonnage . . . more profit. Increase carrying capacity up to 20 tons. Extend frame to any desired length. Load kept in perfect balance . . . no tiercer or end-away. Simple, sturdy, no intricate parts. Timken bearings; steel castings; hydraulic brakes. Readily installed in 8 hours. 8 sizes. **LOW COST**. No priority rating required.

Also makes Little Giant Frame Extensions, Hand Hoists, Wrecking Cranes.

Write for Circulars, Low Prices

LITTLE GIANT PRODUCTS, INC.
1532 No. Adams Peoria, Illinois

PUT YOUR EQUIPMENT ON A POSTWAR BASIS

... build it better with
U·S·S HIGH STRENGTH STEELS

- ★ Increase strength and ruggedness without increasing weight.
- ★ Reduce deadweight without reducing strength, stamina or service life.
- ★ Insure high resistance to corrosion, wear, impact and fatigue.
- ★ Obtain superior formability and weldability.

BRADLY speaking, this group of low alloy, high strength steels—of which U·S·S COR-TEN is typical—can be applied to increase strength, to effect operating economies or to prolong life in practically every kind of equipment that must be moved, or that must lift, support or move other materials.

High strength and low cost are their outstanding characteristics. But each has in varying degrees other desirable properties—increased resistance to corrosion, to wear, impact, shock, vibration or fatigue, easy fabrication—which make it possible to obtain in one grade or the other whatever particular combination of properties is most necessary for top efficiency both in fabrication and service.

There's nothing new or untried about these U·S·S High Strength Steels. They've proved their fitness in thousands of applications.

You will find them in lightweight freight cars that carry extra tons of payload in place of excess weight . . . in buses, trucks, and trailers that weigh less, travel faster and carry bigger loads . . . in earth-moving, materials-handling and mining equipment that consistently sets new records in moving bigger tonnages at lower cost for power and maintenance.

Find out how these service-tested special purpose steels can make your equipment more efficient than ever before. Able to do more work. Longer lasting. Less expensive to operate. Cheaper to keep up. Less liable to break down. Our metallurgical specialists will gladly go over your blueprints and tell you which particular grade of U·S·S High Strength Steels will give you the best results at lowest cost.

AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago, New York
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago

COLUMBIA STEEL COMPANY, San Francisco

NATIONAL TUBE COMPANY, Pittsburgh

TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

United States Steel Supply Company, Chicago, Warehouse Distributors

United States Steel Export Company, New York



**COR-TEN saves 1500 lbs.
in framework here,
with no loss of strength.**

"In these 37-passenger units the framework construction of ordinary steel would weigh 7500 lbs. By using U·S·S COR-TEN we are able to reduce this weight 20% or down to 6000 lbs., without sacrificing any strength."

Signed, Fort Garry Motor Body & Paint Works, Ltd., Winnipeg, Canada.



UNITED STATES STEEL

"BEAR IN MIND" HIGHER S.Q.* STARTS RIGHT IN YOUR SHOP

- ✓ Exclusive asbestos-friction compound, molded on wire-grid back.
- ✓ Constant high co-efficient of friction throughout longer life.
- ✓ Astonishing freedom from adjustment.
- ✓ Precision machined for quick installation.
- ✓ Quick stops...but smooth...and with softer pedal.
- ✓ Most efficient braking performance under all conditions of service.

With drivers and equipment pushed to the limit these days, safe, dependable brakes with higher "Safety Quotient" are a "must". Grizzly Brake Lining fills that bill, rates tops in S.Q. So bear in mind, higher Safety Quotient starts in your shop...starts the moment you reline with Grizzly...continues all through its EXTRA LONG life.

Be sure your fleet rides safely...install Grizzly, the "finest product of the brake lining industry"...and you've fulfilled your trust to your drivers and your equipment! Grizzly Manufacturing Company, Paulding, Ohio.

GRIZZLY REG. U. S. PAT. OFF. BRAKE LINING

LANAGAN

Precision Automotive Testing Equipment
Generator Test Benches • Distributographs • Condenser Testers • Armature Testers • Mica Undercutters • Fuel Analyzers • Electric Tachometers, etc.
LANAGAN AND HOKE
Philadelphia 44, Penna.

★ KEN-TIRE TOOLS ★
KEEP AMERICA'S KEY TRANSPORTATION ROLLING!
★ KEN TIRE TOOLS ★
★ SEE YOUR LOCAL JOBBER OR WRITE FOR ILLUSTRATED LITERATURE ★
THE KEN TOOL MFG. CO., AKRON, OHIO

NEW PRODUCTS

(CONTINUED FROM PAGE 142)

new ointment for the treatment of painful burns. It is called Hydrosulphol, and is said to give quick relief from pain, prevent infection, and accelerate healing.

Reports reveal that the new ointment thwarts penetration by oxygen into scarred tissues, breaks down oxidized cells and helps stimulate the natural restoration of injured tissues. Use Free Postcard For More Details.

P14. New Shop Clothes

To take the place of overalls, and at the same time furnish similar protection, a split-leg shop apron is announced by the Canvas Products Corp., Fond du Lac, Wis., under the trade name "Canpro."

Made from heavy o.d. water repellent canvas that is extra heavy at all points of reinforcement, the "Canpro" split-leg apron has plenty of pocket space with pockets that cannot pull loose.

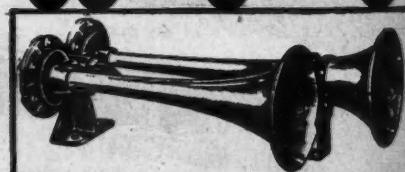
Use Free Postcard For More Details.

P15. Cold Immersion Cleaner

Dip-Zof, an improved cold immersion cleaner for carburetors, fuel pumps, and metal parts, is the latest addition to the Whiz line of automotive maintenance chemicals.

(TURN TO PAGE 146, PLEASE)

**BUELL
AIR HORNS
CUT OPERATING COSTS**



BUELL HIGH PRESSURE AIR HORNS speed up schedules...keep the highways open so that a steady cruising speed is maintained. 12% better road time to the remote!

AIR COMPRESSOR

Why not investigate the possibilities of the Buell Air Compressor for your Post War Plans. The many ways in which it can serve your needs may surprise you. Put air to work. It is clean, powerful and reliable. Write us, advising all details as to volume, pressure, etc., and our engineers will gladly aid you in solving your problems.

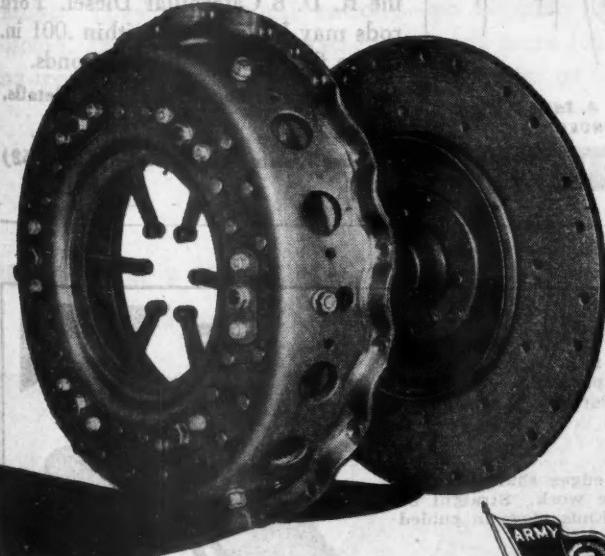


BUELL MANUFACTURING CO.
2908 COTTAGE GROVE AVE. CHICAGO 16, ILL.



A.C.F. MOTOR COACH

THE CLUTCH THAT CAN TAKE IT!



The "daily grind" of stop-and-go bus operation demands a heavy-duty clutch that will stand up to severe service—and Long clutches are just as dependable in such bus service as they are on Allied planes, tanks, trucks and other vital military units. There is a Long clutch of the right size and capacity to meet every bus requirement.

LONG MFG. DIVISION BORG-WARNER CORP.,
DETROIT and WINDSOR



LONG

CLUTCHES • RADIATORS • OIL COOLERS

There's an **EXTRA** in an Edison!



The "greatest name in electricity" is a guarantee of extra service that means more to a battery user than a dozen claims. It pays to replace with Edisons.

Thomas A. Edison, Inc.

EMARK DIVISION — PLANT No. 1, KEARNY, N. J.

YOU CAN ALWAYS RELY ON AN EDISON



Thomas A. Edison
FOUNDER

NEW PRODUCTS

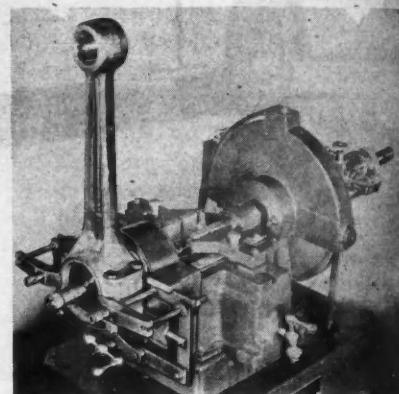
(CONTINUED FROM PAGE 144)

Whiz Automotive Division of the R. M. Hollingshead Corp., states that because Dip-Zof does the job chemically it does away with laborious, time-wasting scraping or wire brushing. It loosens and removes grease, sludge, carbon, gum, varnish, ethyl stain, paint and lacquer.

Use Free Postcard For More Details.

P16. Rod Boring Attachment

A new rod boring attachment, designed by the Tobin-Arp Mfg. Co., of Minneapolis, is used with the model SB shell bearing boring machine for boring semi-finished babbitt rods, inserts in the rod, and the rod forg-



ing itself. This SB-A attachment is fastened to the main casting of the machine without disturbing the setup or the arrangement for resizing shell bearings. It is a compactly constructed unit, fast, accurate and convenient.

The model SB-A has a range to handle all rods up to and including the R. D. 8 Caterpillar Diesel. Ford rods may be bored to within .001 in. of the finished size in 30 seconds.

Use Free Postcard For More Details.

END

(Please resume your reading on P. 62)



Pipe Bender That Bends Pipe Cold

TAL'S PIPE BENDER bends pipe $\frac{1}{2}$ " to 3" dia. Produces smooth, uniform bends. Hydraulic principle makes it easy to operate with one hand. Compact. Portable. Eliminates elbows, fittings. Saves critical materials.

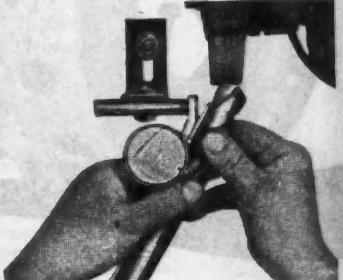
Faster, Accurate Drill Sharpening

Majestic Drill Sharpener sharpens drill edges sharp, evenly, clean-cut, $5/32$ " to 1". Dial for accurate work. Straight or taper-shank drills positioned in trough. Ends move in guided path. Fits any grinder. Write for complete details.

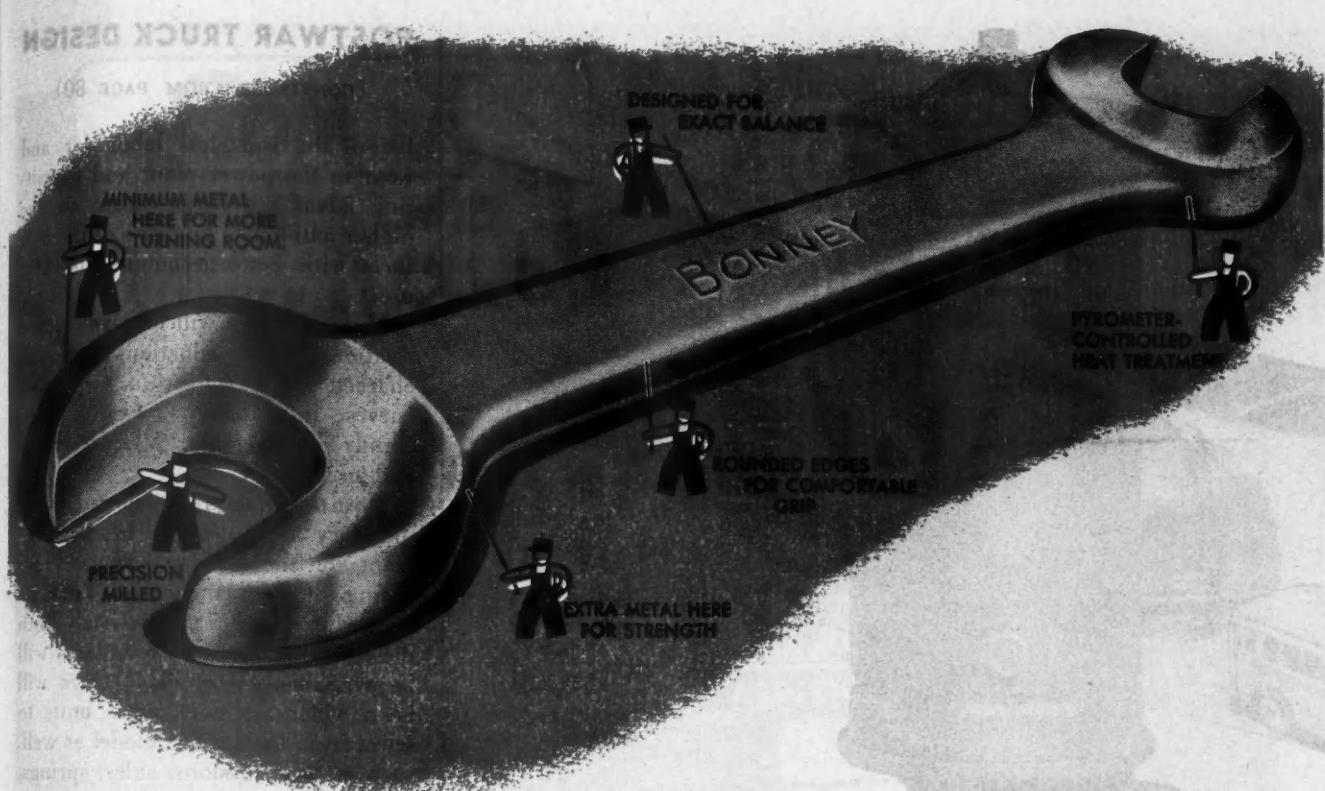
AMERACO Industrial Specialties

122 S. Michigan Ave., Dept. O, CHICAGO 3, ILL.

Style 2 bends $\frac{1}{2}$ " to 2" pipe.
Style 3, $\frac{1}{2}$ " to 3" pipe. Complete, ready to use.



Sharpens drills $5/32$ " to 1", straight or taper-shank. Dial insures accurate work.



It's Easy to See Why They're Better...

It's a funny thing about wrenches. You use them all day long. They're the most important tools in your kit. You know which ones do the job best—which ones last the longest. But chances are you never stop to think why.

When you take a good look at a Bonney Wrench, it's so easy to see why it's better.

The openings in a Bonney Engineers' Wrench, for instance, aren't just milled—they're *precision-milled*. They fit the nut exactly—no slipping, no forcing. The jaws are tapered to give you more turning room. They're reinforced with extra metal at the

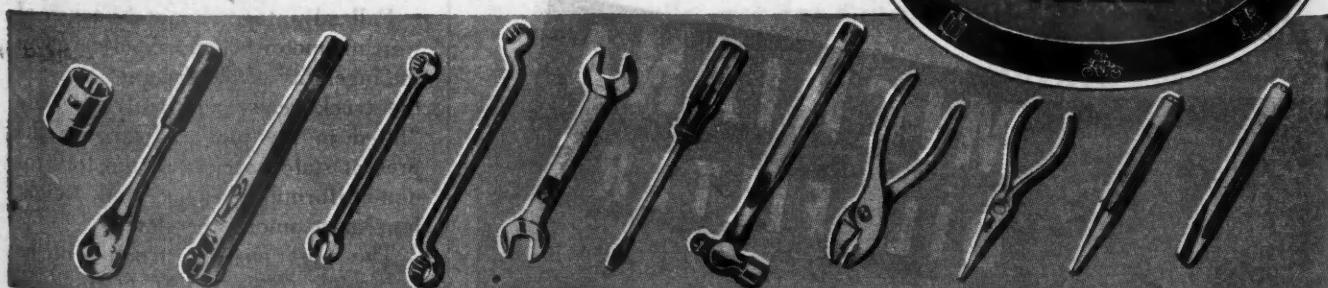
points of strain. The handles are rounded for an easy, comfortable grip. And something you can't see—to make Bonney Wrenches the strongest and toughest on the market, each one is given our special pyrometer-controlled heat treatment.

We put a lot into Bonney Wrenches because we want you to get a lot out of them.

If you do not already have a Bonney Engineers' Wrench Set, ask your nearby Bonney distributor or jobber to order one for you now. All Bonney Tools are sold exclusively through distributors and jobbers from coast to coast.

BONNEY FORGE & TOOL WORKS • 635 N. MEADOW ST. • ALLENTOWN, PA.

In Canada: Gray-Bonney Tool Company, Ltd., St. Clares & Royce Aves., Toronto





THE OIL FILTER BUILT ON EXPERIENCE

(not theory)

The saving in oil and fuel—the many added weeks, months and years of engine life through the use of constantly cleaned oil are well recognized by experienced operators of motor driven trucks, buses, and cars.

In building Oil Filters for millions of horsepower of engines—**MICHIANA** automotive engineers have had the opportunity of knowing at first hand the vital requirements.

Whether you operate gasoline or diesel engines—on land or on the sea—here or thousands of miles away, you can get assured oil cleaning with **MICHIANA** Oil Filters,—longer engine life, reduced upkeep and long low cost, high efficiency performance. **MICHIANA PRODUCTS CORPORATION**, Michigan City, Indiana.



MICHIANA
OIL FILTERS

POSTWAR TRUCK DESIGN

(CONTINUED FROM PAGE 80)

before the war, less labor for and wear in the power plant and permitting advantage to be taken of the higher anti-knock qualities of the new fuels with better economy in their use.

More attention will be given to the relation of gear reductions to engine characteristics, as shown on power curves, in order to result in uniformly progressive pulling effort and/or road speeds.

Most manufacturers will provide at the very least one oversize power plant for the heavier vehicles, consisting of both the engine and its properly related transmission. Both diesel and gasoline power plants will be available. Very likely there will be a wider range of other units to select from for a given model as well, such as transmissions, axles, springs, frames, brakes, etc., to meet varying requirements of certain operations.

Other Improvements

Automatic transmissions, fluid drives and torque converters will be utilized in basic designs. These will really come into general use, however, only through the pioneering and cooperative spirit of certain courageous souls who, as truck operators, are willing for the sake of progress to ignore initial installation, operation and maintenance costs for the time being.

Wide base rims and a simplified, more uniformly progressive range of tire capacities will come with the post postwar truck.

Power steering will become more common for the extremely heavy vehicles, for tractor-trucks and especially for the off-highway types. The off-highway truck will become even more highly specialized and the use of standard stock models of highway vehicles, cobbled up into off-highway conversions, will tend to decrease.

Full advantage cannot be taken of wartime motor vehicle experience and the ingenuity of the designer, nor can the truck really and truly be fully "fitted to the job," as long as the present state barriers in the form of non-uniformity of size and weight laws exist among the states.

The post postwar truck will be
(TURN TO PAGE 150, PLEASE)

CoMaX
BRAKE LINING
TAKES CARE OF ALL
TRUCK BRAKES

For Quick, Safe, Smooth Stops
Wagner CoMaX
BRAKE LINING

**Complete Coverage... All
from One Source!**

You have everything to gain in procuring your *entire* requirements of brake lining from a single source, and you can do it by standardizing on CoMaX brake lining. The CoMaX line not only provides *complete coverage* for all trucks, tractors, and trailers, but also covers passenger cars and buses.

The concern behind the product is another good

reason why it will pay you to standardize on CoMaX.

Our years of experience in designing and manufacturing brakes for original equipment needs, plus our extensive experience in the brake-service field, places us in an excellent position to know what a brake lining should do. This knowledge is reflected in the outstanding characteristics of CoMaX.

CoMaX is unsurpassed for quick, safe, smooth stops, and for long-wearing qualities. Available in rolls, sets, blocks, and slabs.

Write for a free copy of Catalog BU-128

**The Wagner Line also includes
LOCKHEED HYDRAULIC BRAKE PARTS and FLUID**

- For details, ask for Catalog HU-122 •

Wagner Electric Corporation

ESTABLISHED 1891

6470 Plymouth Avenue, St. Louis 14, Mo., U.S.A.

AUTOMOTIVE AND ELECTRICAL PRODUCTS

WAGNER Automotive Products Include: LOCKHEED HYDRAULIC BRAKE FLUID, LOCKHEED HYDRAULIC BRAKE PARTS, COMAX BRAKE LINING, WAGNER AIR BRAKES, and TACHOGRAPH (Recording Speedometer)

845-28

POSTWAR TRUCK DESIGN

(CONTINUED FROM PAGE 148)

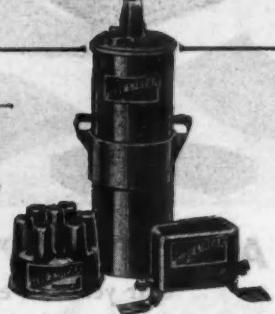


THERE'S ALWAYS ONE THAT'S TOPS...

Whirlaway thundered the Derby mile and a quarter in 2.01½ in 1941; and won 32 races in three years — a record hard to beat. Thoroughbreds that are consistent favorites must have the stamina that's "bred in the bone." In the same way, Blue Streak Ignition Parts are tops with motor mechanics because of their inherent quality. Built for rugged service and longer-lasting, they're unbeatable for a smooth-running ignition system. And like a good tip from the "feed-box", these better parts put more dollars in your bank-roll.



BLUE STREAK
IGNITION PARTS



STANDARD MOTOR PRODUCTS, INC.

37-36 NORTHERN BOULEVARD LONG ISLAND CITY, N.Y.



Specify

Velvetouch
BIMETALLIC FRICTION MATERIAL
for

CLUTCHES AND BRAKES

THE S. K. WELLMAN CO.
CLEVELAND, OHIO



marketed on a more nearly functional basis than ever before. If the vehicle selected will actually fit in and do the job economically, the owner will buy it. If the truck has good performance, is comparatively easy to handle, rides decently and has a comfortable driving compartment, the driver will buy it. If the various components are accessible and reasonably simple for maintenance work, the mechanic will buy it. Unless all three do buy it, it isn't a good proposition for either manufacturer, seller or purchaser.

After V-E Day

The post postwar truck is a truck of the future. This dream truck, in my opinion, will not materialize until after the war in Europe, at least, is over, the pressure of immediate production requirements have been met, and the engineering "lead time" has been whittled away.

No manufacturer has his post postwar truck completely designed or tested as yet. It is still pretty much in the "imagineering" stage. There is that matter of many months of lead time to be disposed of. No manufacturer is yet ready to disclose much

(TURN TO PAGE 152, PLEASE)

Speed up your
battery testing
and assure
greater
accuracy



— by using an
IMPERIAL "K"

No. 515-T
BATTERY
HYDROMETER

Has shatterproof glass —
will stand up under hard
knocks.

Thermometer type — cor-
rects for variations in tem-
perature.

Net price to Fleet
Owner.....\$1.35 ea.

Order from
Your Jobber

THE IMPERIAL BRASS MFG. CO.
1209 W. Harrison St., Chicago 7, Ill.



ARE YOU BUYING Too Many SPARK PLUGS?

When your spark plug replacements run unreasonably high, it is proof that you are using the *wrong* plugs. And the wrong plugs will impose still other penalties, in the form of *decreased engine power* and *increased operating costs*.

Plugs of the wrong Heat Range are just as wasteful as plugs of poor quality. They foul too quickly, or cause preignition, become coated with oxide, and misfire. This reduces engine power, wastes fuel, and makes frequent replacement necessary.

In order to get utmost spark plug efficiency, many operators select replacement plugs according to the AC Heat Range, and keep them properly cleaned and regapped every 3,000-5,000 miles. This holds performance up and costs down—and keeps spark plug replacement at a satisfactory minimum.

SPEED FINAL VICTORY-BUY WAR BONDS

AC SPARK PLUGS

SEND FOR AC SHOP MANUALS

Field Service Department, AC Spark Plug Division, General Motors Corp.
910 Mott Foundation Building, Flint 3, Michigan

CCJ-2

Gentlemen: Please send at once, no charge, the AC Shop Manuals checked:

- | | |
|--|--|
| <input type="checkbox"/> HOW TO SERVICE SPARK PLUGS | <input type="checkbox"/> How to Service Fuel Pumps |
| <input type="checkbox"/> How to Service Spark Plug Cleaner | <input type="checkbox"/> How to Service Air Cleaners |
| <input type="checkbox"/> How to Service Oil Filters | <input type="checkbox"/> How to Service Speedometers |
| <input type="checkbox"/> How to Service Ammeters and other Instruments | |

NAME _____

FIRM _____

STREET ADDRESS _____

CITY _____

STATE _____

**Little Known facts
of a well-known product**



**THE ANTI-DRIFT SPRING
PREVENTS UNINTENDED MESHING**

The wide usage of Bendix Starter Drive in over 65 million installations is due in no small degree to the excellence of design and workmanship of each of its component parts.

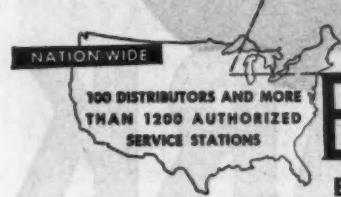
That vital part, the Anti-Drift Spring, for example—made of the finest quality wire—holds the starter pinion away from the flywheel when not in use and thus

prevents unintended meshing.

For quick identification and your protection, the Anti-Drift Spring and other Bendix Starter Drive parts are packed in the well-known blue and white Bendix boxes.

Remember—the name Bendix is your assurance of durable construction and customer satisfaction.

BENDIX AND ECLIPSE ARE TRADE-MARKS OF BENDIX AVIATION CORPORATION



Bendix Drive

ECLIPSE MACHINE DIVISION

BENDIX AVIATION CORPORATION, ELMIRA, NEW YORK

GET LONGER,
TROUBLE-FREE PERFORMANCE
with
Pedrick
precisioneered
PISTON RINGS
in guaranteed
ENGINEERED SETS
For every Car, Truck,
Bus and Tractor

CAMPBELL
LUG-REINFORCED
TIRE CHAINS
GREATER MILEAGE · GREATER SAFETY
INTERNATIONAL CHAIN AND MFG CO.
YORK PA.

POSTWAR TRUCK DESIGN

(CONTINUED FROM PAGE 150)

of his thinking on new design, new features and plans for post war trucks.

If you need trucks and your operation is essential, and you can get an ODT release, buy now. Also do a little forward thinking and place truck orders now for early delivery immediately after Germany is licked. Don't wait for the super-duper dream truck because, in my personal opinion, it will not be available until at least a couple of years after the lights go on again in Europe.

END

(Please resume your reading on P. 84)

Ames Issues New Catalog

The B. C. Ames Co., of Waltham, Mass., has published a new catalog listing dial gages, dial indicators, and precision bench machinery. Many detailed photographs show the construction and precision of these instruments. A simplified format features ready reference and ease of selection of the many available stock models.

New models include several long range indicators, portable types of dial micrometers, and the No. 13 B comparator as well as new developments in the dial test indicator sets.

This 56 page catalog may be obtained free upon request from the Ames manufacturers.

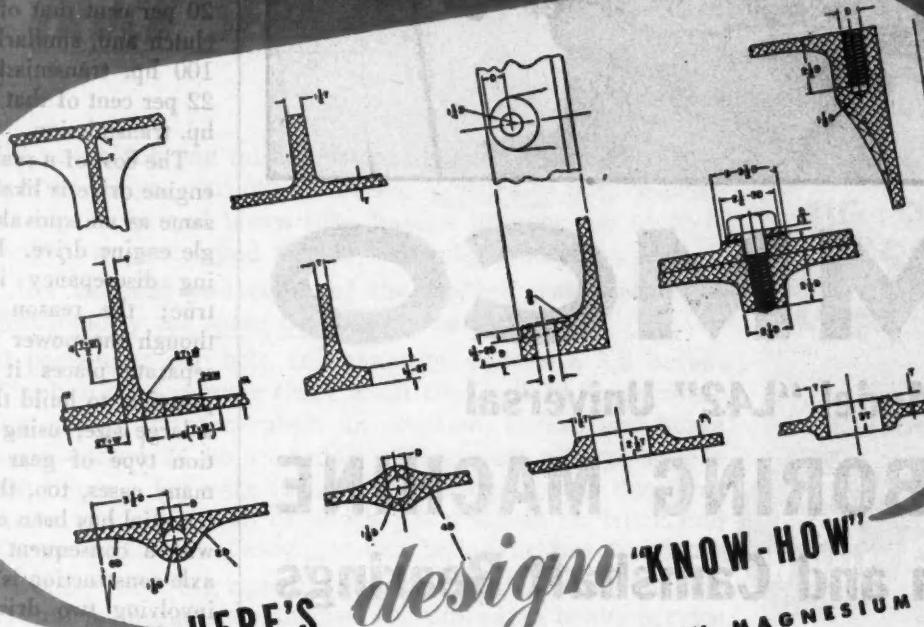
Aluminum Industries Office

Aluminum Industries, Inc., Cincinnati, Ohio, manufacturer of Permite products, has announced the opening of a new sales office at 413 Grant Bldg., Atlanta, Ga. W. E. McDonough, southern division manager, will be in charge.

ECONOMICS OF
INDUSTRIAL SOURCES OF ENERGY

**AMERICAN MAGNESIUM CORPORATION
OFFERS YOU "KNOW-HOW" IN**

design...manufacturing



Designing with Magnesium

HERE'S

design "KNOW-HOW"

EXAMPLES OF SECTION JUNCTIONS AND EMBOSSED IN MAGNESIUM CASTINGS

maximum savings in weight. Then, as you place your designs in production, look to American Magnesium for dependable castings, forgings, extruded shapes, and sheet.

May we assist you in employing the weight-saving properties of magnesium to best advantage? Write to Aluminum Company of America, Sales Agent for Mazlo Magnesium Products, 1719 Gulf Building, Pittsburgh 19, Pennsylvania.

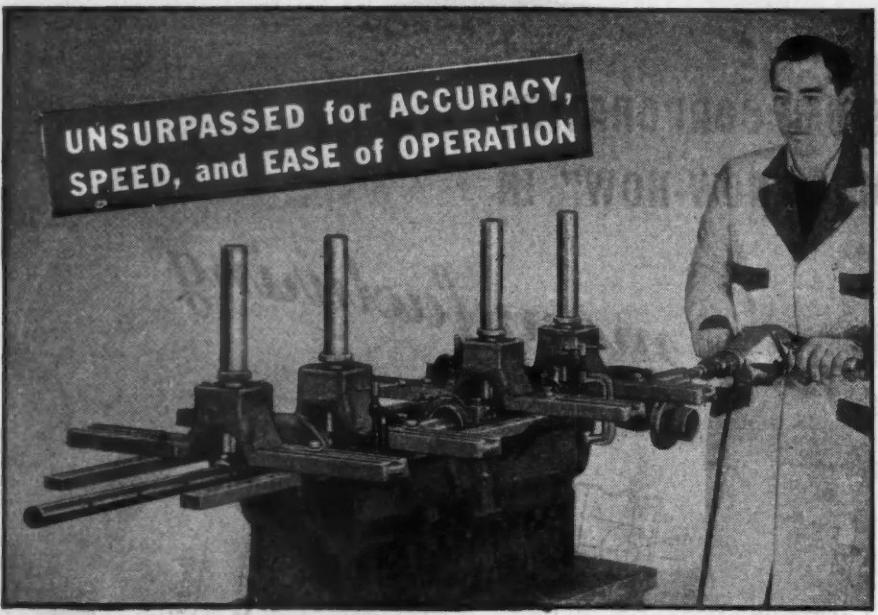
MAGNESIUM



PRODUCTS

**AMERICAN MAGNESIUM
CORPORATION**

SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA



AMMCO

Model "L42" Universal
LINE BORING MACHINE
for Main and Camshaft Bearings

- Takes care of all cars and trucks.
- Sets up in less than 10 minutes.
- Needs no centering rings.
- Accurately bores bearings $1\frac{1}{8}$ " to 4" dia.
- Power driven or hand operated.
- AVAILABLE . . . Ask for new catalog page.



Over our factory flies the ARMY-NAVY "E"—
awarded for excellence in the production of ma-
chinery and tools vitally needed to win the war.

AUTOMOTIVE MAINTENANCE MACHINERY CO.
2100 Commonwealth Avenue • North Chicago, Illinois

Save Pencil Work

Order and Sell
CARTER
PARTS



by the Package!

Carter Carburetor Corporation
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STANDARD & SPECIAL TRUCKS ANY SIZE OR TYPE



AVAILABLE TRUCK COMPANY
2501 Elston Ave., Chicago 47, Illinois

ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 55)

parts of a tractor suitable for 50,000 lb. gross train weight. In each instance this comparison will show the cost of a single 200 hp. unit with that of the cost of two 100 hp. units to be mounted in the same vehicle. Thus, for two 100 hp. engines the cost will be only 30 per cent that of the cost of one single 200 hp. unit. Two 100 hp. clutches will run only 20 per cent that of a single 200 hp. clutch and, similarly, the cost of two 100 hp. transmissions will only be 22 per cent of that of one single 200 hp. transmission.

The cost of a rear axle for the dual engine drive is likely to be about the same as an equivalent axle for a single engine drive. Despite this seeming discrepancy it is nevertheless true; the reason being that even though the power is applied at two separate places it has been found practical to build these units in such a large size, using the single reduction type of gear construction. In many cases, too, the need for a differential has been entirely eliminated with a consequent saving. If a rear axle construction is of the bogie type, involving two driven axles, a substantial saving can be affected by the use of two power plants, each driving its own axle as compared to the single power plant unit acting through the medium of an inter-differential. It is conceivable that on a complete installation of this kind the saving might well run as high as 50 per cent.

So much for the discussion of the comparative costs of the original construction. Another item that might well be considered a function of original cost is the cost of repairs. Ordin-

(TURN TO PAGE 158, PLEASE)

GEAR PULLERS

Garage tools
BUSHING REMOVERS
CREEPER CASTERS
REAMERS
WRITE FOR CATALOG

Cal-Van

MACHINE PRODUCTS INC.

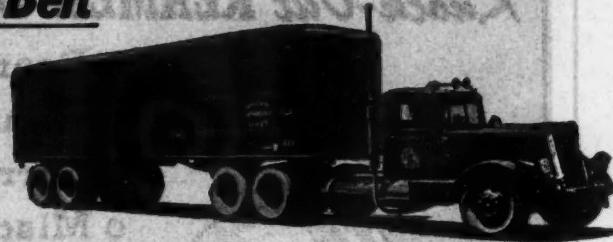
109 WATER ST. JACKSONVILLE, U.S.A.

Order a GATES TRUCK BELT!

Why expect a "Passenger Car" Fan Belt

to Stand Up in

TRUCK SERVICE?



You would never for one minute expect a passenger car tire to stand up in service on your trucks or buses. Naturally not, because you know that on trucks and buses tires have a tougher job to do—a bigger, stronger, more rugged tire is naturally needed.

And just the moment you think of the matter, you realize at once that exactly the same facts apply to belts.

A typical passenger car belt, for example, carries a 3.8 horsepower load. The belt on a regular truck must transmit 13 horsepower to turn the fan, pump and generator. In addition, trucks and buses run longer hours—often 24 hours a day. They must change speeds as many as 600 times a day with rapid acceleration, abrupt deceleration, stops, starts and idling—all of which put a strain on truck and bus belts far greater than a passenger car belt ever has to stand.

Is it any wonder that big operators by the hundreds are turning to the one belt that is specially engineered for this extra heavy service—the Gates TRUCK Belt.

The ONLY Belt Especially Made for TRUCKS and BUSES

No wonder it gives

50% to 80% LONGER WEAR

Read the letters reproduced on these pages. They tell you how practical, experienced, hard-headed operators are getting 50% to 80% longer belt wear since they began using the Gates TRUCK Belt. More important they tell you how much valuable operating time they are saving through fewer road failures and fewer delays for servicing.

If you are interested in keeping your trucks and buses operating most efficiently and economically, call your jobber today and tell him to send you a trial order of Gates TRUCK Belts.

Hundreds of
BIG OPERATORS
say "50% to 80%
Longer Wear"

NEWARK, N. J.

"CUTS
COSTS
IN HALF"

"Really tough service on our milk trucks played havoc with belts until we installed Gates Specially Engineered Truck Belts. We are now using only half as many belts on buses—and saving a lot of time previously spent on belt adjustment."
—Bloomingdale Dairy Co., Inc., Edwin R. Fenton, Maint. Sup't.

MILWAUKEE, Wis.

"Your specially engineered TRUCK belt is now in use on our entire fleet. It is far superior to any belt we have ever used."
—Advance Express Co., Dave Winters.

GATES Jobbers NOW Have Stocks to Serve You!

SACRAMENTO, Cal.

"We installed your Series 'T' Black Truck Belt when it was first placed on the market and it is giving approximately 80% longer service than even your pre-war belt."

—Gibson Lines,
W. T. Smith, Shop Sup't.

"90%
LONGER
SERVICE"

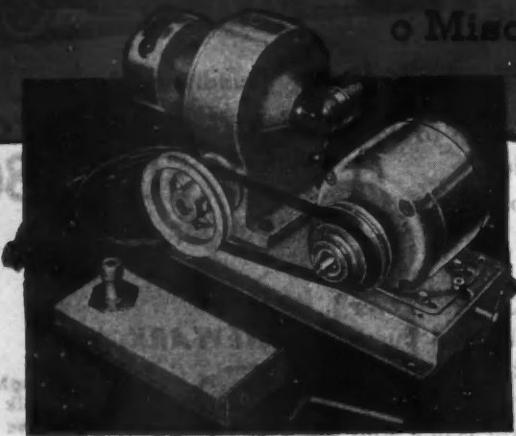
THIS IS A
Gates
PRODUCT

The GATES RUBBER CO., Denver, U. S. A.
World's Largest Makers of V-Belts

There Is A Knock-Out Distributor Near You!

Knock-Out REAMER DRIVES

- Reaming
- Honing
- Burnishing
- Miscellaneous Polishing



Knock-Out Reamer Drives are equipped with hand and foot switches enabling the operator to hold his work in both hands, giving him absolute control of the job. This machine will prove to be one of the greatest labor and time saving units in your shop. Perhaps you've long wanted one to make your equipment complete . . . now you can have one!

SPEEDS	S P E E D S		
	5" Universal Chuck 40 to 1 Gear Ratio (Model D3005)	5" Universal Chuck 20 to 1 Gear Ratio (Model D3000)	5/8" Drill Chuck (For both Models D3005 and D3000)
Slow	20 RPM	40 RPM	600 RPM
Medium	36 RPM	72 RPM	1200 RPM
Fast	60 RPM	120 RPM	2000 RPM

Write for
bulletin
No. 2-25

K.O. LEE CO.
ABERDEEN, SO. DAK.



ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 154)

narily, with adequately proportioned construction the cost of future repairs to any unit of a truck should be considered as a function of the original cost. This being the case, the cost of repairing the component parts will be considerably less with the dual power plant arrangement than it would be in the case of a single 200 hp. unit.

Let us now consider some other details of comparison of a more technical nature. Bearing pressures, for example. In engines I have analyzed for this purpose it would appear to me that bearing pressures are about identical in both the single 200 hp. unit and the individual 100 hp. However, there is more active materials on the pistons and cylinder walls in the double engine arrangement. The unit pressures and surface speeds are less. The clutch for the 200 hp. unit appears to be a little more adequate than those normally furnished for 100 hp. engines. The transmissions for the two 100 hp. units would seem to indicate a factor of safety over and above the single 200 hp. transmission.

To these favorable characteristics can also be listed the additional advantage that two smaller units so reduce the weight of the parts that they may be removed and replaced by a mechanic without the inconvenience of rigging up a hoist or some other special lifting apparatus. For example, the 100 hp. transmission weighs about 150 lb. whereas the 200 hp. transmission will weigh about 480 lb. The availability of repair parts and mechanics skilled in the repair of smaller engines far out-

(TURN TO PAGE 160, PLEASE)

VELVAC
POWER BRAKES
Better Built
for Better Service
REPRESENTED
THROUGHOUT U.S. AND CANADA
VELVAC, INC.—DETROIT 16, MICH.



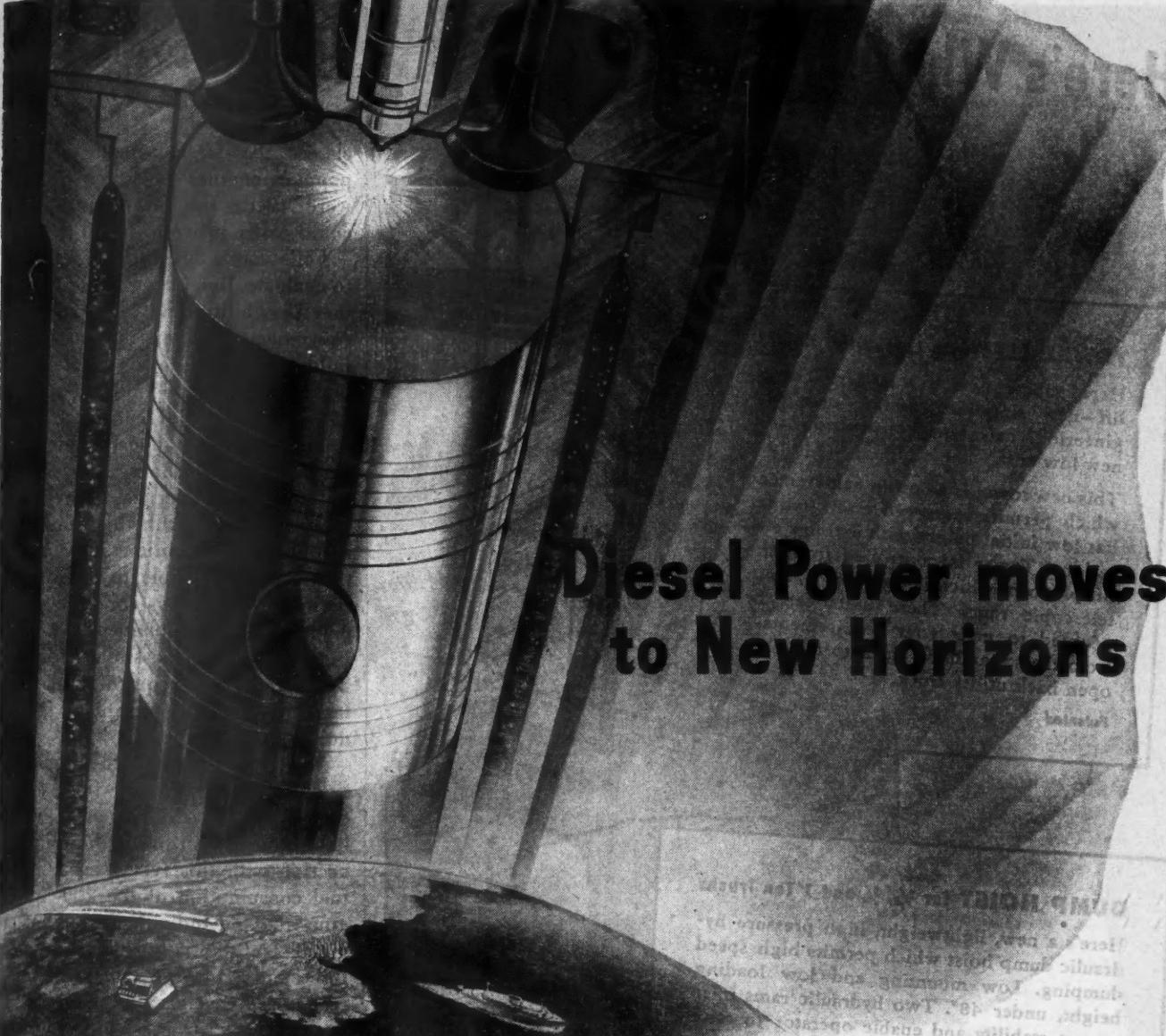
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NEWARK 8 • NEW JERSEY
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Affiliated with C-O-TWO FIRE EQUIPMENT COMPANY

VITAL TO -

- Low Mileage Costs
- Easy Operation
- Maintained Schedules

SKF

BALL AND ROLLER BEARINGS



Diesel Power moves to New Horizons

Tomorrow, Diesel Power will speed commerce around a shrinking globe and lift century-old burdens from the backs of millions.

For our Diesel industry has grown tremendously in the past decade. The lash of war has further stimulated its growth. Tomorrow, Diesel's inherent advantages of economy, high power-output, durability, versatility and ruggedness will be more widely available than ever in history.

America's engine builders have long since learned to come to American Bosch for the engineering skill to apply fuel injection equipment to ever-improving Diesels. Here they also find the New England craftsmanship to meet unheard of demands for precision production in quantity.

These twin skills have come to be known as "Precision Production for Power." Perhaps better than any other, that phrase describes the American Bosch of today and tomorrow.

AMERICAN BOSCH CORPORATION • Springfield 7, Mass.

AMERICAN BOSCH
PRECISION PRODUCTION FOR POWER

Here's What's New in Hydraulic Units

TOWER LIFT with Low Initial Height

Here is the answer to a modern Tower lift—new simplified design, new engineering, new type construction and new low cost.

This new tower is a design achievement which permits improved body styling, has low initial height with extreme elevations. Tower is controlled from the lift platform which is operated by twin telescopic rams. These units can be adopted to meet your requirements—from the streamlined truck to the open back utility truck.

Patented



DUMP HOIST for 1/2, 3/4 and 1 Ton Trucks

Here's a new, lightweight, high pressure hydraulic dump hoist which permits high speed dumping. Low mounting and low loading height, under 48". Two hydraulic rams offer utmost stability and enable operator to raise and lower dump while truck is in motion. No subframe . . . fewer "wear out" parts . . . ideal for hand loading. Designed for the lighter jobs, up to 2000 pounds payload.



Descriptive literature available. When writing please advise in which unit you are interested, Towers or Dump Hoists.



BIRD-WHITE COMPANY

DEPT. C.J.-2, 3119 WEST LAKE STREET, CHICAGO, ILLINOIS

ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 158)

classes the larger single unit. If popular engines of about 100 hp. were used, the availability ratio could easily prove to be 50 to 1.

Following a desirable, though hard to evaluate, line of reasoning the further possibility develops that the inconvenience and expense of a road failure due to a power plant failure is almost entirely eliminated with the two-engine type of construction. It would indeed be a poorly maintained truck that would have a power plant failure on an average of every 60 days. Yet, even with this same poor maintenance condition it would be theoretically possible to extend this period to 3600 days for both power plants failing simultaneously. It is indeed a distinct possibility for such a truck to not require road assistance, due to a power plant failure, during its entire life.

While the matter of fuel consumption is discussed more fully at another point in this paper, I would like to mention it briefly here in connection with this type. The specific fuel consumption of the 200 hp. engine and the individual 100 hp. engine is substantially the same under full load. However, it is generally recognized that gasoline engines suffer a terrific drop in fuel economy under partial load. The reasons are: lower absolute pressure in the manifold, consequently lower final compression and expansion pressures.

Another significant factor deserving consideration is the friction, fan and accessory loads. I have noted on tests that I have conducted that the total drag of an engine at any speed is virtually independent of load. For example, when we ran a test at 2500 r.p.m. and deducted the brake horsepower from the indicated horsepower we got the resulting friction horsepower. When we took this same engine and used a dynamometer to motor it, in order to secure the friction horsepower without any great internal pressure being produced, this friction figure was almost identical with that previously developed under a full load.

The advantage here is definitely in
(TURN TO PAGE 162, PLEASE)

DOUBLE PROTECTION for Trucks and Buses

NO DIM-OUT

WITH *Guide*

NO BLACK-OUT

SEALED BEAM
HEADLAMP UNITS

There is no "dim-out" with a Sealed Beam headlamp unit. This sturdy, metal-backed unit stays bright throughout its long life. It is sealed against dust, dirt and traffic film, to maintain its high light output.

There is no "black-out" with a Guide Sealed Beam headlamp unit in the event of a cracked lens. For safety, a separate self-contained bulb is provided within the sealed unit. If a lens is cracked, the sealed

headlamp unit continues to provide safe lighting until the damaged unit can be replaced. Guide stays on the job even though the "air seal" is broken.

This double protection is an important safety factor. For the best in Sealed Beam lighting, use Guide Sealed Beam headlamp units for replacement. Available for all '40, '41 and '42 model cars, trucks and buses.

LET SAFETY SHARE THE RIDE—REPLACE WITH GUIDE



Guide Sealed Beam replacement units and Guide lamp service parts are sold by United Motors Service distributors.

Guide
LAMP
DIVISION OF
GENERAL MOTORS
ANDERSON, INDIANA

For your future—and your country's—
BUY EXTRA BONDS

BUILDER OF AUTOMOTIVE LIGHTING EQUIPMENT

ROAD PROVED

by Men Who Use Them!

HAYES
FREIGHT LINES INC.

GENERAL OFFICES
Mattoon, Illinois

American Safety Tank Company
Kansas City, Missouri

Gentlemen:

In checking back through our records, we find that we purchased our first American Safety Tank in October of 1936, and since that time, we have purchased from you in excess of 1,000 tanks. During this eight year period, we have subjected these tanks to almost every kind of test which could be made. Many of the first tanks we purchased are still in service. As a matter of fact, they have been used on several different power units and apparently have considerable service still in them.

Our fleet is equipped 100% with American Safety Tanks, which indicates very clearly what we think of them.

Yours very truly,
HAYES FREIGHT LINES, INC.
R. J. Brown
Vice President

HOB:gb



American Safety Tank Co.

UNDERWRITERS LABORATORIES,
INC., A. U. 1302

KANSAS CITY, MISSOURI, U. S. A.

WHY WE RECOMMEND

THESE four steps insure built-in quality in
TUTHILL Springs:

1. Material control based on analysis.
2. Heat treatment, pyrometer controlled.
3. Shot-blasting with latest equipment.
4. Inspection and test for uniformity.

We make both standard and special springs.
Specify your requirements.

TUTHILL SPRING CO.

760 W. POLK ST.
CHICAGO 7

TUTHILL

SPRINGS



ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 160)

favor of the two individual engines, as they can be operated as required. For example, when using a 200 hp. engine where conditions are such that we only require 60 hp. at a governed speed to propel the vehicle, this engine will be running at 30 per cent load and its efficiency consequently will be low. On the other hand, if we supply this power need with the single 100 hp. we get the advantage of the higher efficiency produced by the engine under 60 per cent load. Of course, the vehicle must be so designed as to permit its operation with either or both engines at the option of the driver in order to reap many of these benefits.

Another advantage to be gained by the use of two power plants in the vehicle we have under consideration is the saving in weight, approximating 1000 lb. In many instances this would permit the earning of several thousands of dollars in extra revenue where the loads are restricted by law.

The foregoing would indicate the possibilities for substantial savings in the construction, operation and repair of a heavy tractor using two engines instead of one, the total power being the same in both cases.

Dual Engine for Higher Hp.

The second form of dual engined vehicles to consider is the type in which an extra engine is added to increase performance. For example, if a truck were constructed with two power plants and the savings aforementioned were not taken advantage of but the approach was to provide more horsepower, a truck of superior ability would result. This truck

(TURN TO PAGE 164, PLEASE)

SPRING TONIC



Use DU PONT RADIATOR PRODUCTS

Now it's time to drain out the anti-freeze, clean out the cooling system and seal it against leaks, then put in fresh water and an inhibitor to prevent rust forming during the summer.

Cars and trucks need radiator service now—need the dependable Du Pont products made to do this job. No one should take chances, for neglect may ruin the radiator and tie up the cars and trucks indefinitely. Get an ample stock now, and prepare the cooling system for hot weather driving.



COOLING SYSTEM CLEANSER

—removes rust, scale and grease without reverse flushing. Stops overheating. Increases engine efficiency.

COOLING SYSTEM SEALER

—stops leaks quickly and securely. Does not clog the radiator or harm the parts.

ACID AND RUST INHIBITOR

—neutralizes acid and prevents rust forming in the cooling system. One can lasts all season.



USE THESE POPULAR POLISHES

NO. 7 DUCO POLISH

SPEEDY WAX

DUCO CLEANER

DUCO WAX

The **DUPONT**
NO. 7 LINE

TiteSeal

Stops
Leaks



and

Saves
Gaskets

TITE SEAL makes ANY gasket or Joint Leakproof

TITE SEAL preserves gaskets and protects joints. No need to throw away used gaskets . . . you can't afford to . . . TITE SEAL leaves them like new and ready for reuse.

TiteSeal is



Use Brush-On Aviation Grade on all other gasket work

Telephone 4-7754 - 120 East Third Street CHARLOTTE 2, N.C.

- Heat Proof
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- Vibration Proof
- Non-Hardening
- Leakproof Against Oil, Water, Steam, Grease, Gasoline, Alcohol, Acids, etc.

TITE SEAL never hardens . . . never dries out . . . remains soft and plastic always, even after long service. Motors serviced with TITE SEAL can be disassembled in jig-time.

Use TITE SEAL on all of your metal-to-metal or metal-to-gasket joints. It is the modern, time-saving gasket and joint sealing compound which guarantees that your jobs will be leakproof . . . completely satisfactory to you.

Write Radiator Specialty Company, Charlotte, N.C.
Department B for our helpful TITE SEAL folder.

SOLD ONLY THROUGH THE TRADE

RADIATOR SPECIALTY COMPANY
CHARLOTTE 1, NORTH CAROLINA

RADIATOR SPECIALTY COMPANY OF CANADA, LTD., TORONTO 2,
GOLDEN STATE RUBBER MILLS, LOS ANGELES 1, CALIF.

ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 162)

would have a higher first cost and all the burdens that go with a higher cost such as interest on investment and depreciation, but it also is capable of more ton-miles production.

Under these circumstances it may be well to more fully analyze such a vehicle from the standpoint as to how the actual items of operating expense are influenced. I will only discuss those that are influenced particularly by this specially designed type of vehicle.

Gasoline, Oil and Repairs

It is likely that if motor-miles indicators were used they would indicate that the total revolutions and consequent fuel consumption and engine wear of the two engines in negotiating a grade are no greater than if one engine only had been used and a lower transmission gear restored to. However, in the case of the transmissions considerable saving of wear and the expense of maintaining these units should result because the transmissions will not be used to such a degree in the lower gear. Generally speaking, low gear usage is the index to the life of a transmission.

The foregoing expenses are variable operating expenses that are directly affected as a result of the distance traveled. In any event, these should be only slightly affected.

We will now consider the fixed operating expenses. These often represent the major portion of the total. They are: Drivers and helpers wages, garage rent, maintenance, insurance, licenses and taxes, depreciation, superintendence, interest of investment, overhead, garage, shop and administrative expense. If these expenses are expressed on a ton-mile basis, it will be easy to recognize the substantial reduction due to the greater ton-mile potentiality of the two engined vehicles.

I suggest that any operator who runs trucks long distances over the road, where there are even the slightest grades involved, analyze his operation on the basis of the additional revenue that the extra engine will make possible for the vehicle to earn and deduct from this the additional

(TURN TO PAGE 168, PLEASE)

MULTIPLE POWERS PLANTS



with you, it's livelihood

oil helps protect!

THE FAMOUS VEEDOL P. M. PLAN IS WAITING FOR YOU, TOO!

The Veedol Preventive Maintenance Plan is doing a whale of a job for over 800 hardworking fleets. It can help yours. The plan can be tailored to fit any number of units — and costs only 18¢ per truck.

Write today for a Tide Water representative to call and go over this proven lifeguard for rolling equipment. You can't get started any too soon!



VEEDOL

OILS AND GREASES



BUY WAR BONDS AND STAMPS

You're Doubly Right with EDISON!



1

Right for performance

Edison spark plugs are engineered to get maximum power out of every drop of fuel, with a right type for every motor and operating condition.

2

Right for economy

Long life means less service cost, less replacement cost per thousand miles of operation.

When new spark plugs are needed, it pays TWO ways to replace with Edisons.

Edison
SPARK PLUGS

Edison-Splitdorf Corporation, West Orange, N. J.



BACKED BY THE
GREATEST NAME
IN ELECTRICITY

GLOBITE

Replacement VALVE SEATS

STAY PUT FOR YEARS

Durable port seats are invaluable in heavy duty engines as their heat protection at these high temperature points effects a considerable saving in replacements, welding, etc.

Large and small dimensions to FLEET OPERATOR specifications. Give us port recess counterbore size, and the ring insert will be supplied for a driving fit.

NOT GENUINE UNLESS MARKED "GLOBITE"

AIR shipments offer prompt delivery to distant points

GLOBE CRUCIBLE STEEL CO.
6432 Cass Ave. Detroit 2, Mich.

VALLEY CHARGERS

HAVE Gone To War



For the Duration . . . we will not be able to supply Valley Chargers to our many customers and prospects because our war production demands otherwise take up our entire facilities

Remember Valley Chargers . . . when we can again supply you with those simple, efficient and economical battery-charging units.

VALLEY ELECTRIC CORP.
4221 Forest Park Blvd., St. Louis, Mo.

ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 164)

expense caused by the installation of an extra engine. He will probably find that the earnings will increase in far greater proportion than will the costs. Generally speaking, most items of expense are independent of a vehicle's effectiveness, whereas earnings are directly affected by it.

The foregoing establishes the trend in which more power affects average costs and earnings of heavy vehicles on runs of considerable distances. Few trucks or truck and trailer combinations of over 40,000 lb. g.v.w. have a net tractive factor of over 2 per cent and consequently the additional power will make a marked difference in time on a run of several hundred miles. The extent of increased earnings vary, of course, with individual circumstances.

Automatic Booster Unit

So far I have explained two approaches to the dual engine problem. There is yet a third one. It is the adaptation of the form that includes an extra engine for increased performance. The Clark Automatic Booster Unit has been applied with success to a number of Ford and Chevrolet 1½-ton tractors. The general arrangement of this installation is shown in Fig. 1.

An auxiliary engine is located between the inside of the right-hand frame rail and the propeller shaft at a point slightly ahead of the rear spring front bracket. From this engine, through the medium of an over-running clutch and propeller shaft, the power is put into the countershaft of the transmission by the use of a power take-off. In other words, we have been inclined to view

(TURN TO PAGE 172, PLEASE)

ANY MOTOR TRANSPORT HEATING PROBLEMS?

Consult our Engineers

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ECONOMICS OF

LEADER MUST LEAD

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1. Largest and most complete facilities and resources for product advancement and quality control.
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3. Only maker of metallic, semi-metallic and non-metallic friction materials.
4. Every product specially engineered for every make, model and job.
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6. Products that are easier and more profitable to sell because universally accepted.

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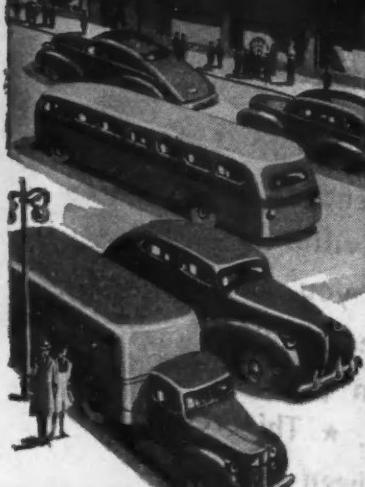
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TOLEDO 7, OHIO**



ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 168)

the power take-off, to a considerable degree in the past, merely for taking power from the countershaft of a truck transmission. However, this is a reversal of that idea and appears to be unique in the respect that the power take-off is now used as an input element. This, of course, adds horsepower and torque to the countershaft and permits its use and application through gears up to the mainshaft in the usual manner.

The idea has considerable merit in the respect that it does not require any synchronization of gear shifting arrangements. The over-running clutch feature eliminates the need for disengaging the auxiliary engine at any time when the truck is operating without it. The outfit, when installed, supplements the horsepower of the Ford or Chevrolet truck to approximately 60 per cent. This makes a substantial difference in performance because all of the normal rolling resistance is overcome by the main engine.

Control of the starting and stopping of the booster engine is entirely automatic, governed by conditions of load on the main engine. These controls are so arranged that the truck driver cannot start the booster engine to cause it to function when the extra power is not needed. The reserve power of the booster engine is available not only on hills but also when any condition imposes an extra load on the truck engine, as in bucking deep snow and when strong head winds have the same retarding effect as a steep grade. The booster operates also to provide faster acceleration to normal speed after a slowdown or stop, and so is of advantage

(TURN TO PAGE 175, PLEASE)



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Mfg. by ALLIED EQUIPMENT CO., DETROIT

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WRITE FOR LITERATURE AND NAME OF YOUR TRUCKSTELL DISTRIBUTOR

ECONOMICS OF MULTIPLE POWER PLANTS

(CONTINUED FROM PAGE 172)

in congested traffic areas, saving time and helping to maintain a rapid flow of traffic.

When the truck is running in high gear under the power of the main engine alone, the booster engine does not start as long as the truck can maintain a road speed of more than 31 m.p.h., or other predetermined minimum speed. When, however, the truck encounters a grade sufficient to cause it to slow down, with wide-open throttle, to 31 m.p.h., the booster engine automatically starts and cuts in, adding its power to that of the main engine. The booster engine remains in operation then until the truck reaches a speed of 45 m.p.h., whereupon the booster engine automatically cuts out.

On grades so steep that even with both the main engine and the booster engine in use it becomes necessary to use a lower gear, the shifts are made in the ordinary manner, and the booster engine still assists the main engine.

From the foregoing it appears that there are many applications where extra power will be a truck user benefit. It is my considered opinion that the use of multiple power plants offer the best current solution to this need.

END

(Please resume your reading on P. 56)

New Detergents Co. Formed

The Optimus Detergents Co. has been organized and is in operation at Matawan, N. J., manufacturing industrial detergents and developing new cleaning methods for industrial use in its research laboratory and pilot plant.

Better—but not
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FRINK SNO-PLOWS OF CAN. LTD., TORONTO, ONT.

BATTERY SHORTAGE

(CONTINUED FROM PAGE 41)

stopped. Excessive drain of current is hard on the battery, especially in the winter. He should avoid grinding the starter excessively when the engine is hard to start. When using the starter he should depress the clutch pedal to decrease the load on the engine. He should keep a vigilant eye on the ammeter and check for lack of charge or overcharging, and report promptly any great variation in the reading.

The mechanic has a definite responsibility in prolonging battery life. In his periodical checking of the battery, he should keep a record of the history of each one so that he will know exactly when each has been serviced and what to expect in future servicing. This practice will introduce a definite routine that will insure proper and frequent checking.

Navy's Maintenance Program

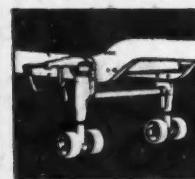
The Navy has adopted a system for weekly checking of the electrolyte and general condition that could be adopted to fleet requirements. A weekly inspection report is used as a check-off sheet, and various columns label each step so that the shop foreman knows exactly what has been done to each truck battery.

The Navy has developed a program of essential battery maintenance embracing five important procedures for prolonging battery life and efficiency. Excerpts from the program follow.

"The principal factors affecting battery life are: Lack of water, loose hold down straps, overcharging, undercharging and battery "dopes" used in the electrolyte.

"Water is lost as the result of charging and should be replenished
(TURN TO PAGE 178, PLEASE)

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A complete line of **LANDING GEARS . . . HORIZONTAL, VERTICAL and FOLDING TYPES**



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It produces fast, accurate work (to within .0001") easily.

If you own a Sunnen Bushing Grinder, be sure you are making full use of it. If not—write for complete information.

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The coveted Army-Navy "E" waves over the Sunnen plant—evidence of the important part Sunnen equipment is playing in the war effort.

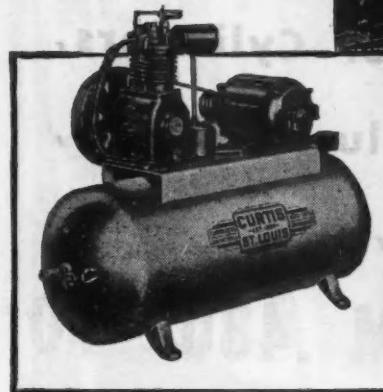
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2-AXLE DRIVE

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Detroit 19, Michigan**

BATTERY SHORTAGE

(CONTINUED FROM PAGE 176)

as soon as the liquid level falls to the top of the separators. If water is not replaced, and the plates become exposed, the acid will reach a dangerously high concentration that will char and disintegrate the wood separators, thus impairing performance of the plates. Plates cannot take full part in the battery action unless they are completely covered by the electrode. Sulphuric acid need never be added to a cell unless spillage has occurred.

"Hold downs, if not properly adjusted, allow the battery to bounce in the cradle. This will not only crack battery cases but also do severe damage to the plates by causing the active material in the grids to drop to the bottom of the battery.

"High generator charging rate burns up the plates and separators. The violent gassing action forces the active material from the plates so that it collects in the bottom of the cell and thus is lost.

"A battery operated with insufficient charge over a long period of time may develop a coating of the plates which will permanently reduce the battery capacity. In addition, a partially discharged battery is liable to freeze during severe winter weather. The electrode of the battery in various stages of charge will start to freeze at temperatures indicated:

Freezing Temp.

Specific Gravity Deg. Fahr.

1280 (fully charged) —90

1220 —31

1200 —16

1100 +18

"No satisfactory substitute electrolyte has been found for the simple
(TURN TO PAGE 180, PLEASE)

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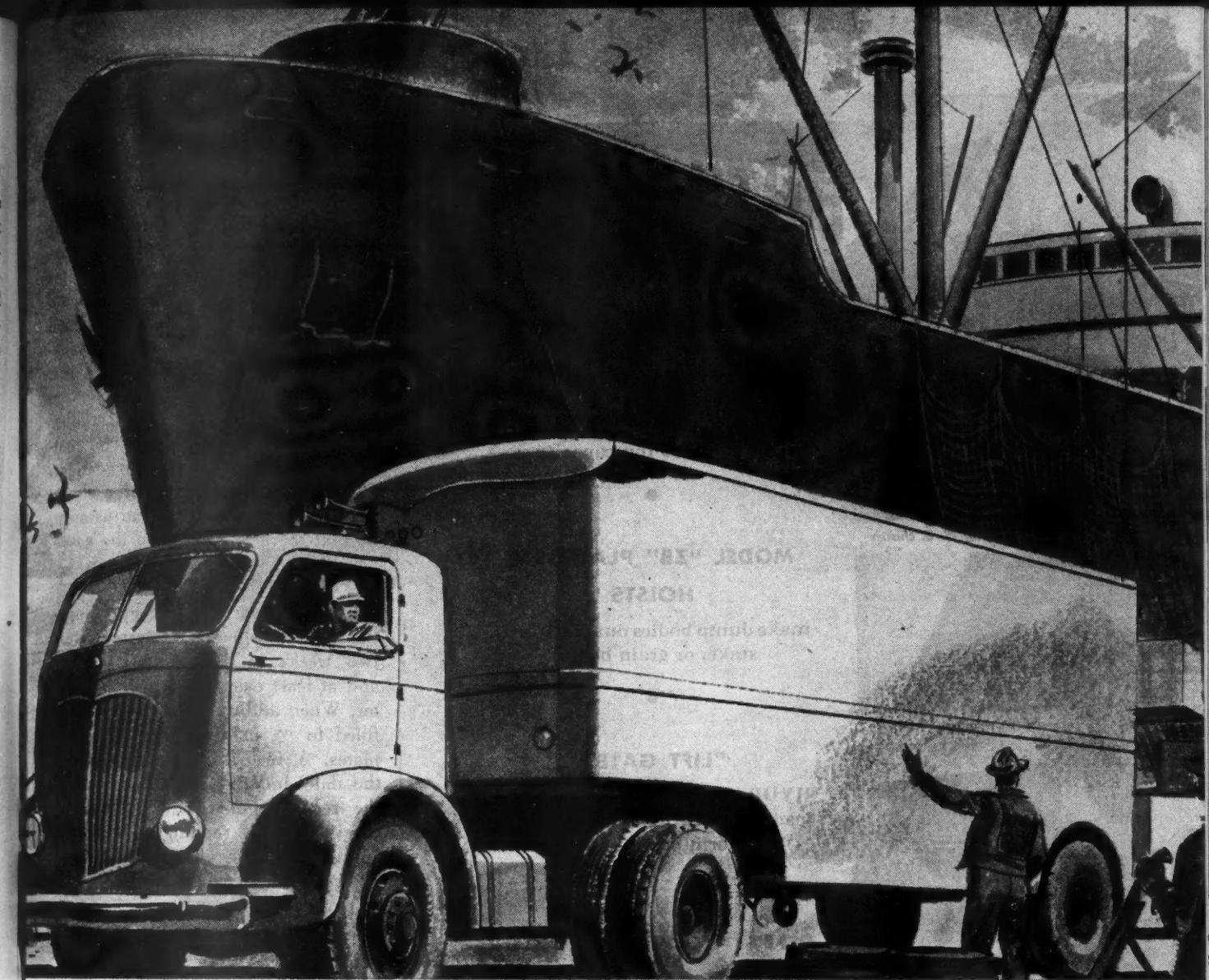
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Filling the yawning bottoms of thousands of waiting ships is one of the trucking industry's greatest contributions to the war effort. How well this job has been accomplished is evidenced by the ceaseless flow of vital materiel to the widely scattered fighting fronts of the United Nations ★ Here is a new and glorious chapter of America's transportation progress being written before our very eyes and one which will weigh heavily in forcing the ultimate peace ★ For a task well done, Bendix-Westinghouse salutes the industry as a whole and appreciates the

heavy role it has been privileged to play in furnishing a dependable power-to-stop which so adequately fulfills the slogan, "Safety Standard of the World." ★ Fighting now for Victory, Bendix-Westinghouse Air Brakes and Pneumatic Controls await only the coming of peace to bring even greater benefits to the trucking industry which has every right to expect big things from the two greatest names in braking.

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For double mileage, double econ-
omy, use the double-bar-reinforced
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THE MCKAY CO., PITTSBURGH, PA., York, Pa.



BATTERY SHORTAGE

(CONTINUED FROM PAGE 178)

mixture of sulphuric acid in water. Use no substitutes. To do so may injure the battery and void the manufacturer's guarantee. Pure water for use in automotive batteries should be either distilled water or a good grade of chemically analyzed drinking water approved for battery use.

"Battery water should be kept in a covered earthenware, hard rubber or lead containers. Watch for batteries that require excessive water. It may be an indication of a charging system that is out of adjustment, or that there is a crack in the case."

Basic Battery Program

To avoid wartime battery failures, the battery should be tested every two weeks in the summer months and at least every month in the winter. When adding water it should be filled to $\frac{3}{8}$ in. over the top of the plates. A record should be kept of the date and the amount added. In the record should be included the specific gravity readings of each inspection, the regulator setting and the adjustments made. It should be recharged if the reading is less than 1.225.

The voltage regulator should be
(TURN TO PAGE 182, PLEASE)

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SPEED
RECORDER**



Designed especially for commercial vehicles, locking device assures accurate information on maximum speed of operation during any one trip. Safeguards against abuse of engines by over-speeding.

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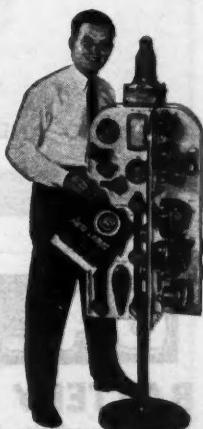
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AND BUSES ARE
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HEAVY DUTY PISTONS

ZOLLNER MACHINE WORKS FORT WAYNE, IND.

BATTERY SHORTAGE

(CONTINUED FROM PAGE 180)

checked as well as the current regulator since this device protects the generator from overload by limiting its output to a safe value. Voltage regulators must operate within extremely narrow limits. A slight difference in voltage setting will produce a large difference in the amount of charging current going to the battery.

The battery carrier and compartment should be kept clean and dry. The corroded condition sometimes found on the carrier is caused in many cases by spillage resulting from overfilling of the battery. When this condition is found, the battery should be removed and cleaned with a bicarbonate of soda solution (1 lb. to

(TURN TO PAGE 184, PLEASE)

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LONGER LIFE FOR
TRANSPORT
EQUIPMENT



REPLACE WITH

LINK-BELT



ROLLER BEARINGS

Inherent self-aligning and free-rolling features of Link-Belt Roller Bearings reduce friction and wear in front wheels, rear axles and differentials of all types of automotive equipment.

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BATTERIES SHORTAGE

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BREAK

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BIG in size
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The name "BIG VAN" for these Eberhard locks has triple significance. Know-how, gained through years of experience, has produced them specifically to lock the BIG heavy doors of vans and similar large truck bodies.

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give the remarkably satisfactory performance which so many users have significantly described as GREAT. All Eberhard products are characterized by expert designing, liberal proportioning and careful machining—which have caused the Eberhard **E** to be widely accepted as a symbol of the best that is obtainable in vehicle hardware.

BATTERY SHORTAGE

(CONTINUED FROM PAGE 182)

1 gal. of water). It should then be rinsed with clean water and the rusted surfaces painted.

The battery should rest firmly in the cradle. In tightening the hold-down straps, care should be taken that they do not break or distort the battery case. The posts and terminals should be cleaned, scraped, greased and tightened firmly. The cables should be checked, and frayed or broken ones replaced.

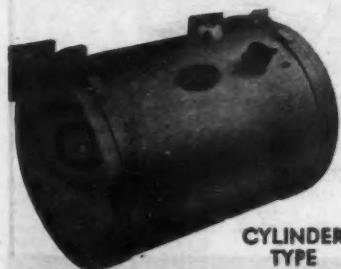
Periodic Checks

The specific gravity of the electrolyte should be tested at frequent intervals with a reliable hydrometer. Hydrometers are usually calibrated to read accurately only when the electrolyte is at a certain specified temperature. When taking readings at a temperature other than standard, it is necessary to make corrections. For every 10 deg. the temperature is above the standard, 0.004 must be added to the reading. For every 10 deg. below the standard, 0.004 must be subtracted. All cells will have a gravity reading of approximately 1.285 when fully charged, and 1.150 when completely discharged.

In making the voltage test, check the voltage of each cell with a low-reading voltmeter under operating load (crank engine with ignition switch off). The individual cell reading should not drop below 1.5 volts per cell at 60 deg. Fahr. or above. The difference between cell readings should not be more than 0.2 volts. Batteries that do not meet these conditions should be removed and the plates and separators inspected.

END

(Please resume your reading on P. 42)



You must get the MOST from your present truck equipment to keep War Material moving.

Large capacity SNYDER (patented) Safety Fuel Tanks will eliminate unnecessary refueling delays. By the use of the Flame Guard Safety Valve (standard on all Snyder tanks) added protection is afforded against fire hazards. Capacities range from 28 to 50 gallons in the cylinder type; 75 to 125 gallons in the saddle type. Approved by the Underwriters' Laboratories, Inc.

Distributed in all principal cities. Write for descriptive literature.



SNYDER MANUFACTURING CO.

Dept. CC

BUFFALO, N. Y.

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Structure of the metal from which Fuller gears are made is metallurgically controlled to assure long life and maximum service. Alloy steels, after their specifications are carefully checked in Fuller's own metallurgical laboratory, are forged in Fuller's own forge shop to form the gear blanks; and every step in every operation to the finished gear is performed by Fuller workmen in Fuller's plants.

This has paid dividends to owners of Fuller-equipped trucks. The service record of Fuller transmissions under today's trying conditions is proof of the value obtained through Fuller's control of manufacturing processes and laboratory checks. These important factors are your promise of supreme quality in the Fuller Transmission of Tomorrow.



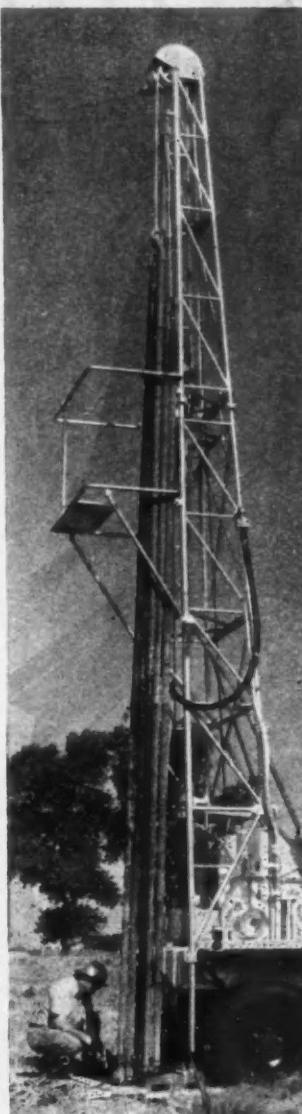
FULLER MANUFACTURING COMPANY, KALAMAZOO, MICHIGAN

Transmission Division

Unit Drop Forge Division, Milwaukee, Wisconsin



FABCO DUAL DRIVE IN OIL FIELD EXPLORATION



● In their search for new fields, oil companies the world over use drilling rigs furnished by the Geo. E. Failing Supply Company of Enid, Oklahoma. Many of these rigs are mounted on standard trucks equipped with **Fabco Dual Drives**, which provide the maximum in power and traction for equipment engaged in this rugged, off the road service.

Simple in design, with heavy duty construction throughout, they will take your equipment in and bring it out with a minimum of lost time. Using standard truck axles, world wide service on repairs is assured. **Fabco Dual Drives** are available without allocation. Illustrated bulletin sent on request.

HOME-MADE MACHINE REBABBITTS BEARINGS

(CONTINUED FROM PAGE 49)

by adjusting the coarse threaded balancing screw.

The rod is then heated with the acetylene torch until the tinning begins to melt. At this moment the switch is turned on, and the machine spins the rod at the rate of 1300 r.p.m. Molten babbitt is poured in to the bearing through the opening in the sealing plate. A ladle, to which a six-inch lip was welded, is used for this operation. It insures against spillage or the flying out of the babbitt. A metal shield which covers half of the rotating parts is installed to protect the operator.

The regulating of the thickness of the babbitt is only a matter of experience. Enough metal to make a casting $\frac{1}{8}$ in. thick is poured into the housing. The excess metal is removed on a bearing boring machine.

Plain shell bearings give no particular problem with this process. When rebabbitting the crankcase main thrust bearings that have overlips, the two-piece jigs shown in the upper part of Fig. 2 are used. They have a cut-in space to allow for the lip.

This machine is not only simple in construction but also rugged. It has been running eight hours a day in our shops, turning out perfect work.

END
(Please resume your reading on P. 50)

Marguerre Issues New Catalog on Welding Equipment

A new 24-page welding equipment catalog has been published by the Marquette Mfg. Co., of Minneapolis. It features many new models of the AC Arc Welder and lists prices of welding accessories.

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KANSAS CITY, MO.

for PRECISION REPAIR WORK

Write for catalog sheets on all Logan Lathes

No. 21C Bench Model, Swing Over Bed, $10\frac{1}{2}$ "

LOGAN
ENGINEERING CO.
Chicago 30, Illinois
A Name To Remember
When You Think of Better Lathes

RBC
ROLLER BEARINGS
help Transport Men and Material

Over the Road

ROLLER BEARING COMPANY OF AMERICA
TRENTON NEW JERSEY

HERE'S WHY H-W HYDRAULIC JACKS are easier to operate

In a split-second, mere finger pressure is transformed into a lifting force of several tons

- 1 Exert a 2 lb. pressure on the end of jack handle "A".

- 3 ... Which becomes a 2½ ton upward force on the ram, since the lower surface of the ram has 100 times the area of pump piston "C".

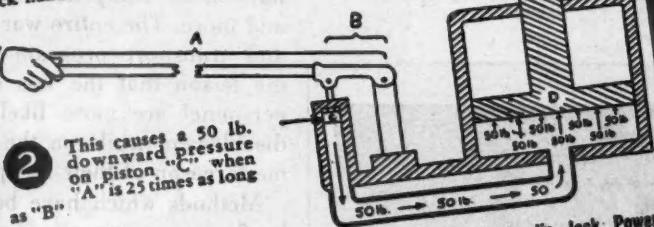


Diagram above shows basic principles of Hein-Werner Hydraulic Jack Power



**Super-Powerful...Easy-Operating
and Absolutely Dependable**

HEIN-WERNER HYDRAULIC JACKS

Made in models of 3, 5, 8, 12, 20, 30, and 50 tons capacity

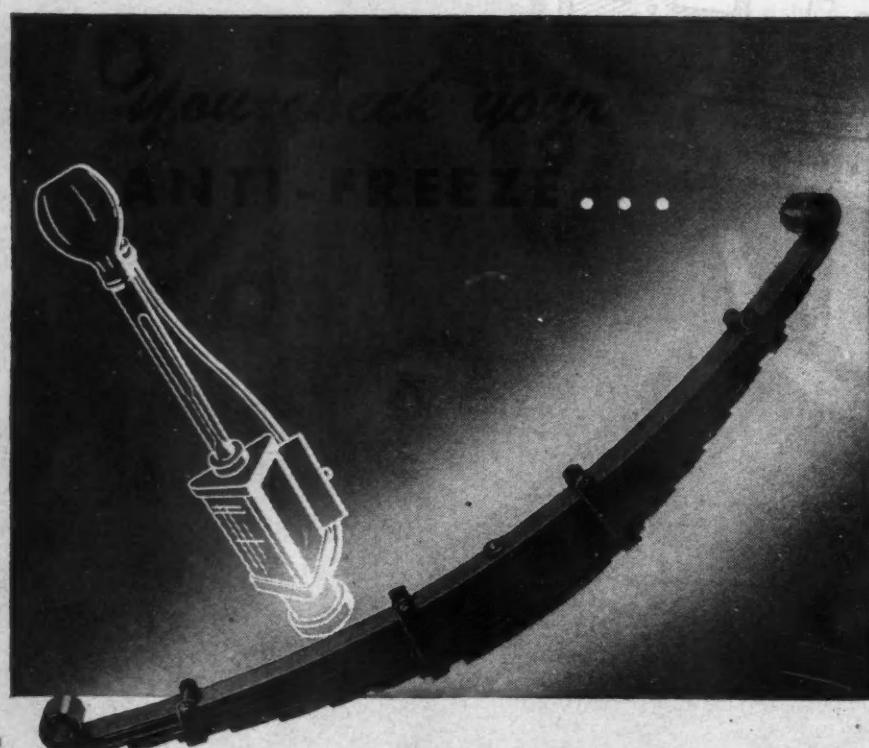
HEIN-WERNER MOTOR PARTS CORP.

WAUKESHA, WISCONSIN

New Films Help Promote Safety in Shop

PERHAPS no industry has felt more keenly the shortage of trained help than has the motor vehicle field, and this shortage has been especially serious in the field of

highway transport. To keep vehicles rolling in wartime has taxed the resources and ingenuity of our fleet operators, and it has been largely in the maintenance shops of these or-



but who checks your SPRINGS?

Call nearest Rowland Distributor. He's supplied by these branches:

ATLANTA 3, Ga., William and Harvey Rowland, Inc., 449 Marietta St., N. W.

BIRMINGHAM 3, Ala., Birmingham Spring Service, Inc., 2017 Avenue B, South

CHICAGO 16, Ill., William and Harvey Rowland, Inc., 2732 Indiana Avenue

JACKSONVILLE 4, Fla., Jacksonville Spring & Alignment Co., 137 Jefferson Street

PHILADELPHIA 30, Pa., William and Harvey Rowland, Inc., 1414 Fairmount Ave.

PITTSBURGH 13, Pa., Point Spring Co., 419 Melwood St.

Your maintenance department needs all the help it can get. One sure way to see that your vehicles' springs are properly serviced is to make certain they get the practical, experienced care that only spring specialists can give them and such specialized care is available from nearly a thousand Rowland Spring distributors. They offer a wealth of experience in servicing thousands of trucks and buses. Call Rowland distributor near you for periodic spring inspection and service, as well as replacement SPRINGS, mufflers, wheel suspension parts and universal joints.



WM. AND HARVEY **ROWLAND INC.**
FRANKFORD, PHILADELPHIA 24, PENNA.

SPRINGS: MUFFLERS - WHEEL SUSPENSION PARTS - UNIVERSAL JOINTS

150th ANNIVERSARY OF AMERICA'S OLDEST LEAF SPRING MANUFACTURER

ganizations that the shortage of competent and trained mechanics and helpers has been most acutely felt.

Conservation of what available trained manpower there is has, therefore, become a matter of supreme operational importance. This conservation has been partly achieved by introducing effectual methods of safety education, especially among less experienced mechanics and helpers upon whom the fleet operators have been compelled to rely more and more. The entire war production and transport program has taught the lesson that the less experienced personnel are more likely to suffer disablement while on the job by the mere reason of their inexperience.

Methods which have been enlisted by fleet operators are varied, including talks, manual or text book study, printed rules, and so on. Now, a series of basic shop safety slidefilms are available which will serve as well in the small motor transport service shop as the large one. Each of these eight subjects covers one basic phase of service shop safety practice, and each supplies visual material for a single lesson or session. This type of slidefilm—the "discussional" type—is a strip of 35 mm. safety motion picture film on each frame or segment of which is a picture. Pictures are arranged in logical sequence to provide safe procedure patterns with letterings superimposed on the film to amplify the meaning, and to serve as a guide for the shop foreman or whoever conducts the safety course for the fleet operator. (The distribution of these films has been undertaken by the Jam Handy Organization, 2900 E. Grand Blvd., Detroit.) Some of the material has been used by the armed forces.

The fleet operator may use these visuals in any one of several ways:

1. As basic shop safety material upon which to build an educational program.

2. As plus material to integrate with any safety education which may already be in use.

3. As "refresher" material to use repeatedly as mechanics and helpers forget and grow careless.

Every fleet operator knows that it is the violation of basic shop safety rules that most frequently takes men off the job for hours and days, and that these most frequent accidents

(TURN TO PAGE 190, PLEASE)

ULRICH OIL CO.
WEST POINT, NEBR.
GASOLINE • INFLAMMABLE

1. Ball and socket joints at each end of equalizer beams reduce friction and provide maximum flexing action.

2. Equalizer beams are mounted below the center of the axle, using the load to absorb a portion of the torque normally caused by braking.

3. Rigid equalizer beams eliminate misalignment of axles caused by an uneven deflection of springs.

4. Long-wear, replaceable bronze bearings pivot the equalizer beam for uniform distribution of weight on four wheels.

5. Thrust bar keeps both springs parallel and eliminates any torsional side deflection.

6. Springs are restricted to load-carrying function only. They are not relied upon to maintain axle alignment.

7. Exclusive Heil-designed torque tube provides the necessary torque reaction for braking without transmitting this force to any part of the tank structure.

8. Rubber bushed torque tube yokes require no lubrication.

9. Four point mounting of entire tandem suspension distributes load equally.

10. The Timken Tubular steel axles save weight yet are so rigid that they have the ability to withstand the downward

thrust of the payload and the twisting effects of sudden brake applications.

11. Heavy-duty two shoe brakes with "S" type, constant-lift cam to assure even application represent the best in efficient brake application.

12. Wide brake liners reduce pressure per square inch resulting in smoother, more uniform brake application.

13. Generous, oversize tapered roller bearings let wheels run freely. Adjustments are easy to make.

14. All Heil Trailerized Tanks may be equipped with Westinghouse air or Bendix vacuum brake systems.

15. Mounting frame is an integral part of the tank structure eliminating the welding of longmembers to tank shell which is apt to produce localized stresses and leaks.

T-123A

Designed to meet specific road laws

To move a lot of gasoline fast . . . the petroleum industry depends on Heil Trailerized tandem axle tanks and Trailered tank trains. If your hauling problems require maximum payloads under specific

road laws, Heil Trailerized tanks will give you greater total gallonage at lower cost.

Ample testimony from experienced operators establishes the Heil Tandem Axle as the most satisfactory tandem in use today.

Write for bulletin.

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

"Why did Frank's truck stand idle a whole hour?"



You'll never be able to correct those delays or that lost time that you don't know anything about! If you don't even know that they are occurring, these expensive idle periods will keep right on eating into your carefully planned delivery schedules.

But equipped with the SERVIS RECORDER, you can know each day of all delays and idle time—exactly as if you were riding on the truck yourself, all day long. Even better, the *Servis Recorder* gives it to you *on paper*—a graphic chart of what the truck did all day—a permanent record that you can file away for monthly study and comparison. Sounds like magic, doesn't it?—but it's just a common sense little instrument that you can quickly attach to the truck cab with merely 3 screws!

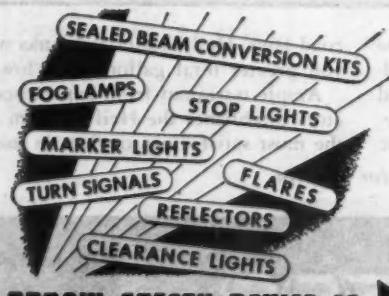
Besides checking idle time, the *Servis Recorder* helps in nine other ways—all fully described in our booklet—"Ten Ways of Getting More Work Out of Motor Trucks." It's free. THE SERVICE RECORDER CO., 1375 Euclid Ave., Cleveland 15, Ohio.

Shows

BUSY TIME
IDLE TIME
OVERTIME
ETC.



The Servis Recorder
Tells Every Move Your Truck Makes



NEW FILMS PROMOTE SAFETY IN SHOP

(CONTINUED FROM PAGE 188)

account for a very large part of man-hours lost through disablement. It is, therefore, this class of hazards which the eight new films set out to interpret and eliminate. Subjects in the series are as follows:

PLAY SAFE AND WORK SAFELY:

This film reveals how workers must share in shop safety, covers the general principles of safety in using tools and shop machinery, shop conduct, connecting portable electric appliances, lifting heavy objects and proper use of ladders.

MAINTAIN A SAFETY SHOP:

This one pictures and explains conditions that cause accidents, handling and storing materials, disposal of scrap material, wiping cloths, protruding nails.

SAFETY INSPECTION:

Covers the selection of mechanic or helper as shop "safety engineer," shop hazards, getting co-operation from others, and "selling" safety.

TRAINING FOR EMERGENCIES:

Clothing caught in a machine, location of emergency services, using fire extinguishers, using a fire blanket, turning in a fire alarm, escape and rescue from a burning building, electric shock, escape and rescue, poisoning.

TREATMENT FOR BLEEDING, ETC.:

Principles of first aid applied to common shop accidents, types of wounds, how to stop serious bleeding, treatment for shock, preventing infection.

AIDS FOR INJURIES, ETC.:

Bone and muscle injuries, eye injuries, burns, unconsciousness.

(TURN TO PAGE 192, PLEASE)





LONG TRANSPORTATION CO.

DETROIT

CHICAGO

PITTSBURGH

"Steelductor HELPS IMPROVE GAS ECONOMY"

says

W. E. LONG, Long Transportation Company

1020 10th Street, Detroit, Mich.

"WE'VE been using Auto-Lite Steelductor spark plug wire in our trucks for over a year," explains Mr. Long, "and are highly pleased with performance results."

Across the nation, fleet owners are proving that Steelductor in shielded

circuits helps improve performance of trucks and buses. If you have trouble maintaining schedules because of inferior or worn ignition cables, find out how Auto-Lite Steelductor is helping fleet operators coast to coast. See your jobber, or write to

THE ELECTRIC AUTO-LITE COMPANY

Merchandising Division

OHIO

TOLEDO, 1

TUNE IN "EVERYTHING FOR THE BOYS" STARRING DICK HAYMES—EVERY TUESDAY NIGHT—NBC NETWORK

AUTO-LITE

Automotive
WIRE and CABLE



If you feel like this after cleaning garage floors GET SOL-SPEEDI-DRI

If the labor of cleaning oil and grease from garage floors and drive-ways with solvents, brushes, and caustics makes your back feel as though you could never straighten up, it's time you tried SOL-SPEEDI-DRI.

You can spread SOL-SPEEDI-DRI around all working areas and then forget it. With no more effort on your part, this remarkable absorbent will soak up all the oil and grease. When you sweep up with a stiff broom, your floors will look like new.

SOL-SPEEDI-DRI has many uses around the shop. Stops slipping accidents, for it's completely non-skid. Makes your garage clean and tidy. Used correctly it prevents the tracking of oil and grease across the floors and into cars. Tumble your greasy tools into a pan of it, and they'll come out clean.

Save labor, time, and cleaning costs with SOL-SPEEDI-DRI. There's really nothing like it. FREE SAMPLE? Sure! See your jobber (they all stock it). Write your nearest supplier.

SUPPLIERS: East—Refiners Lubricating Co., New York 1, New York.
Midwest & South—Waverly Petroleum Products Co., Philadelphia 6, Pa.
West Coast—Waverly Petroleum Products Co., Russ Bldg., San Francisco 4, Calif.

SOL-SPEEDI-DRI
OIL AND GREASE ABSORBENT



KEEP 'EM RUNNING

with
KEX
TIRE PLUGS

The
Wedler-Shuford Co.
St. Louis 3 Mo.

PAT. FEB. 4, 1944
KEX
REG. U. S. PAT. OFF.

PREMIER DIRECTIONAL SIGNALS

For New Vehicles
For Replacements
Merry Types
PREMIER SIGNAL CO., Belvidere, Ill.

NEW FILMS PROMOTE SAFETY IN SHOP

(CONTINUED FROM PAGE 190)

EYE PROTECTION:

Need, selection, use and care of safety goggles, welding goggles, welding helmets, hand shields.

POWER SUPPLY:

Starting and stopping machines wired independently of each other, machines wired through a disconnect switch, using motor controllers and emergency stop stations, changing speeds of machines, shifting V-belts, shifting overhead belts. Each motor vehicle service shop will integrate this visual material into its own safety education program to the best advantage. However, certain visual teaching techniques have been introduced for the first time into this series which make it easier and simpler for the foreman to plan and conduct his basic shop safety lessons.

First, each subject has been planned and prepared so that the instructor does not have to spend his own time (before the meeting) relating the visual material to the lesson. Each lesson is arranged so that it may be used as more than one lesson if desired, and the course not only provides organized lessons but also a lesson-plan, and test and review questions at the conclusion of each subject.

One great advantage of this type of training film, as revealed in the wartime automotive training programs for the armed services, is that it is of great aid to a teacher who may know his mechanical stuff perfectly well but who hasn't had much actual teaching experience. It provides a procedure pattern and guide that not only saves the foreman's time but also his labor.

END
(Please resume your reading on P. 202)

O.D.T. SAYS

TRUCKS
are fighting equipment
vital to Winning War..

KEEP YOURS FIRING
...every cylinder at
Top Efficiency!

RAMCO 10
PISTON RINGS

FOR TIMKEN'S "BALANCED BRAKING"

MEEHANITE BRAKE DRUMS

The Timken-Detroit Axle Company, Detroit, Mich., designs and tests axle units to provide "Balanced braking." Careful studies of brake linings in conjunction with various brake drum materials have revealed that Meehanite brake drums provide the metallurgical structure required to achieve better resistance to heat checking and scoring—the commonest cause of brake drum failure. This is a result of the uniform, dense structure and wear resistance of the Meehanite and the controlled distribution

of the finely divided graphite flakes in the matrix of the metal.

Timken Brake Drums are given complete dynamometer tests in the Timken laboratory as shown. This machine permits thorough tests with automatic control and recording of instrument readings. The accumulated knowledge acquired from these tests means better service and lower per ton-mile cost to truck owners.

Write for our bulletin "Brake Drums."

MEEHANITE RESEARCH INSTITUTE
NEW ROCHELLE, N. Y.



A DEFECT in the smallest ignition part will halt a mighty truck or bus. Play safe by insisting on top quality replacement parts and Fuel Pumps and parts. Kem Komet replacements are pre-fitted on master gauges that duplicate your own equipment. This unique precision-fitting keeps your trucks and buses rolling longer; helps your mechanics turn out better jobs in less time. The Kem Komet pre-fitted starting, lighting and ignition line is complete, often better than the parts they replace. Heavy-duty construction gives you extra value per part—plus margins of quality in insulation, wiring, welding, machining and oversizes. Leading jobbers stock Kem Komet pre-fitted replacement parts and Fuel Pumps and parts everywhere.

Here's One Answer to Mechanic Shortages

Series of 10 Trouble Shooting Manuals on High Speed Motors only 25¢
10 fact-packed manuals give clear, complete answers to ignition and other motor troubles. Amply illustrated, highly informative, written by engineering expert. Complete set only 25¢.



GMC Combat Vehicle Performs Mission of Mercy

More than 400,000 GMC trucks and "ducks" have taken part in the war effort. Of all the duties performed by these military vehicles, none is more important than the transport and care of our wounded.

The 2½-ton "six by six" furnishes the motive power for one of the army's latest type surgical operating units. Each unit is equipped with white walled canvas, instrument cabinets and scrub sinks, and becomes a highly mobile unit which provides facilities for 80 to 100 operations in a 24-hour period.



KEM  **KOMET**
Prefitted
MANUFACTURING CO., INC.
601 WEST 26TH STREET
NEW YORK 1, N. Y.

SILVER ANNIVERSARY
KEM celebrates a quarter century of service to industry.

CUT YOUR SPEED
TRIM YOUR LOAD
CHECK YOUR AIR
MATCH YOUR DUALS

MAKE YOUR TIRES LAST
SEIBERLING
Experts in Rubber


PURITAN
Super BRAKE FLUID

MAKES RUBBER PARTS LAST LONGER!


A Name That Grows Bigger and Bigger

SIMPLEX
Piston Rings

WASHINGTON RUNAROUND

(CONTINUED FROM PAGE 36)

the category of electric irons, refrigerators and such like. . . . To date OPA's handling of ODT's former gas-rationing functions has been without incident. Incidents, if any, are not expected until the third quarter of the year, when operators file special seasonal demands. . . . This department was asked this question by a seeker of light in Government employ: "Since Federal vehicles are not compelled to pay vehicle registration fees, will the Government pay state fees on the trucks of the seven Midwest lines which it seized and is now operating?" A pertinent question, and doubtless it will be pertinently answered.

END

(Please resume your reading on P. 37)

FREE PUBLICATIONS

(CONTINUED FROM PAGE 58)

owners. While the booklet is technical in its outlook, it is easy to read and is supplemented with photographs to show the reader just what to look for in diagnosing failures of brake drums.

Since heat checking and scoring is the most common cause of brake drum failure, fleet operators who want better service and lower cost per mile will want to acquaint themselves with these vital facts so that they can deal with the problem efficiently. A copy is available to those writing L230 on the free postcard.

L231. Lubrication Publication

An 8-page publication devoted to a thorough discussion of "Low Temperature Sludge In Automotive Gasoline Engines" is now available to the fleet operator. This publication, as the title implies, is devoted to a study of the causes and remedy of sludge formation in engines that run at low temperatures.

The experiences and recommendations of fleet operators themselves are featured. They have outlined 14 precautions to observe in preventing formation of sludge.

(TURN TO PAGE 198, PLEASE)

GALION

ALLSTEEL HYDRAULIC HOISTS and DUMP BODIES

economically handle all
material hauling jobs !



\$3,173,250,000
already budgeted for
postwar highway
construction

GALION distributors are everywhere. Contact them for complete information on the hoists and bodies you need to handle this post-war highway construction work.

THE GALION ALLSTEEL BODY CO. • GALION, OHIO

KEEP VITAL TRANSPORTATION IN SERVICE



PROTECTIVE motor maintenance is the constant practice of men responsible for the efficiency, long-life and economical operation of vital transportation. They never relax their fight against sludge, gum, acid and corrosion.

It's simplicity itself—for **LOOSITE** safely and economically rids the entire lubrication system of dangerous petroleum residues. Then **SILOO**, added

to fresh crankcase oil, functions continuously—preventing further accumulations. Engines—gasoline or diesel—operate at maximum efficiency, oil reaches every vital part—thus costly layups and repairs are avoided . . . engine life prolonged.

You're miles and dollars ahead when you use **LOOSITE** and **SILOO**. Your dealer or jobber has them.

PETROLEUM SOLVENTS CORP., Gen. Off.: 331 Madison Ave., New York 17, N. Y.
Solvents For All Types of Petroleum Residues

For sale by leading jobbers everywhere, and the White Motor Company branches and distributors.

SELF-CLOSING MONKEY LINK



Trade Mark Reg. U. S. Pat. Office

Good Truck Fleet Operation Includes TIRE CHAIN MAINTENANCE

Don't risk the loss of any of your irreplaceable trucks because of the lack of proper inspection and repair of your tire chains. Far sighted economically minded Operators are now preparing for winter driving and checking their stock of

MONKEY LINKS

Keep MONKEY LINKS in your shop and on your trucks—No tools required; your drivers can fix a break immediately. Don't delay. Order your winter's supply of MONKEY LINKS today.

FLOWER CITY SPECIALTY CO., Rochester, N. Y.
At All Reliable Jobbers

FREE PUBLICATIONS

(CONTINUED FROM PAGE 197)

The effect of heavy duty detergent oils is discussed, and photographs show that this type of oil is an important factor in promoting successful engine operation. Finally, the cleaning of sludged engines is given careful treatment. Ten practical steps are outlined in this process.

The publication is well worth the attention of every fleet man. He can procure a copy by writing L231 on the free postcard.

L232. Fire Extinguisher Chart

Every fleet man should know how to use the fire extinguishers in his shop. A new chart is now available which will give vital information on how to handle and care for the various types of extinguishers found in fleet shops.

After a short study of this chart, one also is prepared to deal with the various kinds of fires which are apt to occur. The right information with a little thought beforehand may save a building or a truck later, so get a copy by writing L232 on the free postcard.

END

(Please resume your reading on P. 59)

Standard of Indiana Changes

Completing forty-eight years of service with Standard Oil Co. (Ind.), Amos Ball, vice president in charge of sales and a director long prominent and widely known in the petroleum industry, retired on Jan. 1.

Roy F. McConnell, now general manager of sales, moves into the vice presidency, and H. E. Hanson, now ranking assistant general manager, becomes the general manager of sales.

KOETHERIZING

The one best way to restore collapsed pistons to original factory fit.

Every pulled piston should be Koetherized.

KOPPERS COMPANY

American Hammered Piston Ring Div.

BALTIMORE, MD.

The companies with * are operators of fleets which are partially or fully equipped with DeLuxe Oil Filters



DeLuxe Congratulates the 1944 Winners

with an especial bow to the CONNECTICUT RY. & LTG. CO.

The wide preference among fleet operators for the type of oil cleansing performed by DeLuxe is exemplified by the wide use, year after year, of DeLuxe Oil Filters by the winners of Bus Transportation's Maintenance Efficiency Awards.

Among the list of Award Winners this year are many users of DeLuxe Oil Filters. We congratulate them all . . . and especially our good friends the Connecticut Railway & Lighting Co. who are 100% DeLuxe equipped, and whom we are proud to number among our oldest customers.

It is through engineering work made possible by the cooperation of such companies as this old friend of ours that many of the advancements today embodied in DeLuxe Oil Filters were brought to present-day perfection.

DELUXE PRODUCTS CORPORATION, 1406 Lake Street, La Porte, Ind.

DELUXE Oil Filter

DOES MORE THAN STRAIN OIL . . . MORE THAN FILTER OIL
ACTUALLY CLEANSSES OIL





Butyl Rubber Released For Light Truck Tubes

After Jan. 15, Butyl synthetic rubber may be consumed in the manufacture of tubes for light trucks, the

War Production Board announced.

The new regulation applies to tubes for both government and civilian use in sizes 6.00x17, 6.00x20, 6.50x17 and 6.50x20.

Tubes in the four light truck sizes have been manufactured from Buna S, the general-purpose synthetic rubber, because the supply of Butyl was insufficient.

The use of Butyl inner tubes in the sizes specified will make available better tubes for the users of light trucks. Butyl is the synthetic best adapted

for use in tubes and is superior to crude rubber in its resistance to air leakage WPB said.

The new expansion in the use of Butyl for inner tubes is the second since Nov. 9, 1944. Butyl has been permitted for tubes only in very large truck and bus sizes down through and including 7.00 cross section.

ODT Gets Right to Ration Used Commercial Vehicles

Authority to ration all used commercial vehicles, in the event such rationing should ever become necessary, has been delegated to the ODT by the WPB. The authority was transferred to ODT under an amendment to Directive 36 which last June gave ODT authority to ration new commercial vehicles. The action was designed to simplify administrative procedure.

The ODT has made use of its new rationing authority by issuing an order prohibiting the transfer or acceptance or transfer of fluid food motor tank vehicles without ODT's prior approval. ODT approval is also required for dismantling, converting, remodeling, or for other alterations or for diverting or removing any such vehicle from the service or territory in which it is used.

WPB Authorizes 19,304 Trailers for 1945

WPB has approved the construction of 19,304 commercial trailers and 2961 third axles in 1945. The production program calls for 10,768 commercial trailers for the first half of 1945 and 8536 units for the third and fourth quarter. This is far short of the estimated 50,000 required.

The plan calls for 1786 third axles for the first half of the year, with 1175 to be produced in the third and fourth quarter. It has been estimated that 4800 would be required.

New 6,000,000 Tire Program To be Launched in March

WPB is rapidly bringing to a close the preliminary work necessary to start production of the additional 6,000,000 extra heavy military, civilian and aircraft tires required yearly. On Jan. 4, WPB Chairman J. A. Krug announced that the allocation of this expansion between companies on a tentative basis, subject to area man-

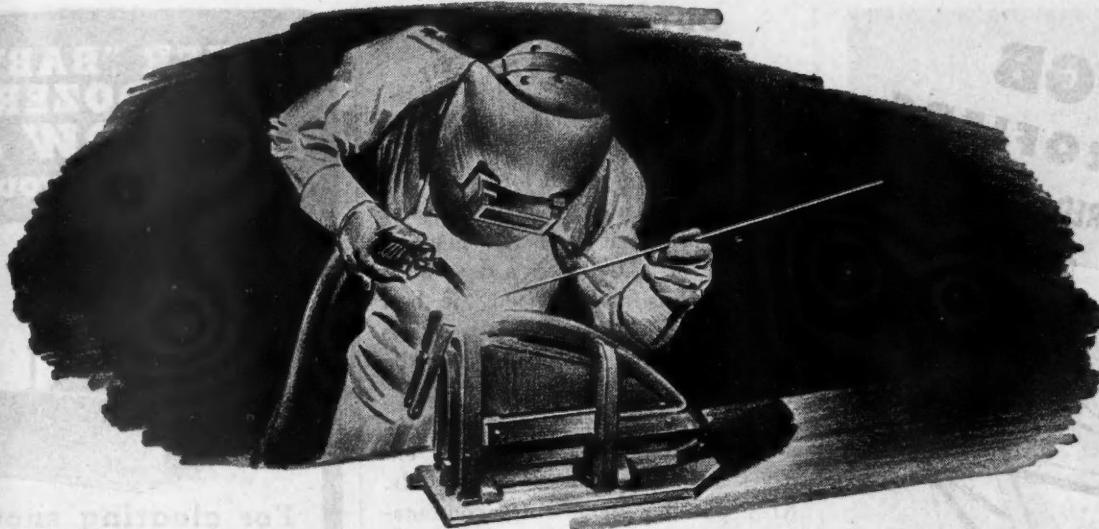
(TURN TO PAGE 202, PLEASE)



"JOE FORGOT TO SPECIFY ASF SAFETY 5TH WHEEL!"



ASF Safety 5th Wheel
Automotive Division
AMERICAN STEEL FOUNDRIES
400 NORTH MICHIGAN AVE., CHICAGO II, ILL.



New techniques in working magnesium alloys are changing product ideas



Dow engineers can give you
the facts on design—
application—and fabrication

Through shop techniques as modern as magnesium itself, this lightest structural metal is now extending its usefulness to wide new fields of application. Freed from outmoded limitations, products are taking new forms in the design trend of today.

Magnesium alloys find ever-widening applications as castings, forgings, extrusions, sheets, plates and strips. Essential to the success of these uses is the fact that magnesium is readily worked and joined by all common methods: machining, bending, drawing, pressing, spin-

ning, blanking, punching, shearing; and by riveting and arc, spot, gas and flash welding.

Much of this progress has been contributed directly by the pioneer producer of structural magnesium, The Dow Chemical Company, during 29 years' experience in its own shops and through close cooperation with other fabricators. Results of all this work are now available to you directly from Dow men who participated.

Expert consultants on Dow's staff are ready at all times to work with you.

DOWMETAL magnesium

MAGNESIUM DIVISION, THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN
New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle



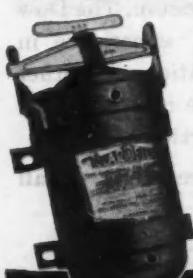
THE METAL OF MOTION



TO KEEP OIL CLEANER, LONGER

WGB Clarofiers are adopted by manufacturers, specified for fleets. Leading builders of gas and Diesel engines install WGB Clarofiers as standard equipment . . . and countless cost-wise fleet operators have specified them for their vehicles. Check their three reasons. (1) They keep lubricating oil amber-clear for longer periods. (2) WGB replacement cartridges are inexpensive, and can easily be installed, without tools. (3) WGB Clarofiers are sturdy, simple, trouble-free—built for heavy-duty jobs. Specify WGB Oil Clarofiers for substantial savings in maintenance and operating costs.

Send for your free copy of book describing WGB oil clarifying at work in gas and Diesel engines.



WGB
OIL CLARIFIER, INC.
KINGSTON, N.Y.

LET'S KEEP SEDIMENT OUT OF LUBRICATION

ODT—OPA—WPB

(CONTINUED FROM PAGE 200)

power checks, had been concluded the previous day.

This program called for about 20,000 extra tires a day, but the industry oversubscribed it by better than 50 per cent, or 33,000 tires a day. WPB accepted this and selected the best combination of the industry proposals to get the program through in the shortest possible time.

The increased program calls for new plants and expansion and annexes on existing plants and, as Mr. Krug put it, "about every combination you can think of in plant facilities."

The cost of the total expansion has been estimated at \$70,000,000. About two-thirds of the total new production will be taken up by new plants. About 27,500 additional tubes a day are also required.

The "Big Four," Firestone, Goodyear, United States Rubber and Goodrich, are taking about one-half of the total program. Firestone, Goodyear and United States Rubber will produce about 3000 a day, Goodrich will turn out about 2000 daily and the remainder is being placed in small plants, capable of producing anywhere from 50 to 1000 daily.

All of the 6,000,000 additional tires will not be produced this year, according to Mr. Krug. The first production is expected in March and it is estimated that it will take about 10 months to produce the first 6,000,000.

The new plants will probably be in new areas, so as not to further complicate the manpower situation. This

(TURN TO PAGE 204, PLEASE)

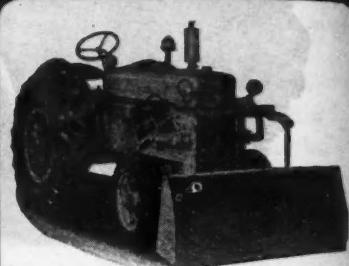
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FOR SALE

UNIVERSAL TOOLS: DANDY 10 Piece Set: BRAKE-SPRING Pliers, CON-ROD Socket, CEE-TEE Pliers, Carburetor JET WRENCH, CHANNELLOCK PLIERS, Brake Adjusting Star-NUT Wrench, Diagonal Cutters, NEEDLE-NOSE Pliers, Screwdriver, Vise-Grips. \$19.85 Remit with Order Today! Other Tools Needed? REMEMBER: "We have it. Can get it, or it isn't made." DEALERS TOOL SUPPLY, 1527 Grand, CCJ, Kansas City, Mo.

SALES MEN, new selling bus and fleet owners. Established repair item. Steady repeats. Substantial commission. Exclusive territories. Statement of availability required. Box No. 66, Commercial Car Journal, Chestnut & 56th Sts., Phila. 39, Pa.

BAKER "BABY" BULLDOZER for SNOW or what have you?



For clearing snow from truck parking lots, runways, approaches and highways adjacent to warehouses, the Baker Light Bulldozer, Model 282, mounted on an International wheeled tractor, is ideal. It has full hydraulic control and greater maneuverability. It gets in and out of corners—goes anywhere—easy to operate—high capacity. When not moving snow, it has many other clean-up uses—leveling yards, filling holes, removing debris, etc. Ask for Bulletin 835.



Handling manure from 1200 horses at large Indiana farm—one of many uses for the Baker Baby Bulldozer.

THE BAKER MFG. CO.
571 Stanford Avenue
Springfield, Illinois

BAKER TRUCK &
TRACTOR
SNOW PLOWS



THEY KEEP RING SLOTS *Clear*

Once the slots in oil control rings become clogged, the whole process of building up to an engine overhaul *accelerates*. For this reason alone, the installation of AC Oil Filters and regular replacement of filter elements is worth many times its cost.

Efficient oil filters, kept functioning by regular replacement of dirt-loaded elements, are the surest protection against clogged ring slots. And they also effect other worthwhile economies. From hundreds of fleet experiences, it is proved that AC Oil Filters and AC Elements check oil and fuel waste, retard carbon formation, and prolong ring and cylinder life.

So, AC Oil Filters and Elements not only save you shop expense, and fuel and oil. They also reduce your breakdown time. And *that* benefits both you and the war effort.

**FILTERS—for every engine
ELEMENTS—for every filter**

SPEED FINAL VICTORY—BUY WAR BONDS



FILTERS

SEND FOR AC SHOP MANUALS

Field Service Department, AC Spark Plug Division, G. M. Corp.
910 Mott Foundation Building, Flint 3, Michigan

Gentlemen: Please send at once, no charge, the AC Shop

Manuals checked:

CJ-2

- How to Service Spark Plugs How to Service Fuel Pumps
- How to Service Spark Plug Cleaner How to Service Air Cleaners
- HOW TO SERVICE OIL FILTERS How to Service Speedometers
- How to Service Ammeters and other Instruments

NAME _____

FIRM _____

STREET ADDRESS _____

CITY _____ STATE _____

The "B" Line to GREATER PROFITS

**Build a
Bigger
Brake
Business with
Brake Parts
Brake Fluid &
Brake Tools by**



EIS MANUFACTURING CO. • MIDDLETOWN, CONN.

ADECO NOZZLE TESTER

FOR DIESEL ENGINES
AND HYDRAULIC DEVICES



KEEP DIESEL ENGINES RUNNING AT PEAK EFFICIENCY

With this sturdy, portable, light-weight Adeco Nozzle Tester, any mechanic can easily make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Adeco advantages have made this America's most widely used nozzle tester. Tests both large and small injectors, on bench or engine. Avoids costly delays and possible damage to engine. Keeps diesels operating at peak efficiency.

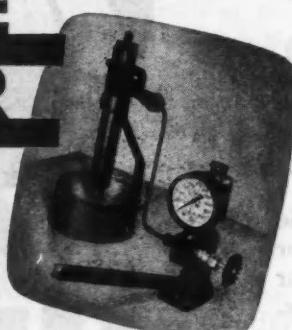
Write for new illustrated bulletin.



AIRCRAFT & DIESEL EQUIPMENT CORP.

4411 NORTH RAVENSWOOD AVENUE

CHICAGO 40, ILLINOIS



FOR TRUCK PISTON PIN FITS

★ Eliminates Honing

★ Long Pilots for
Alignment Jobs

★ 12 Sizes Service

98% of All
Trucks



REAMER DRIVES
AVAILABLE

Dual-Spiral Flutes . . .



... spiral in opposite directions simultaneously, finish-reaming mirror-smooth finishes to close tolerances. One does the work of 5 to 7 conventional expansion reamers because of expansion range of .035" to .080".

FOR HOLES IN

- Pistons
- Conrods
- Steering Gear
- Shackles
- Fan & Pump
Housings

WRITE FOR CATALOG

LEMPCO

5734 DUNHAM ROAD
BEDFORD • OHIO

ODT—OPA—WPB

(CONTINUED FROM PAGE 202)

new program will further drain crude rubber stocks, but no accurate figures on the exact quantity are available.

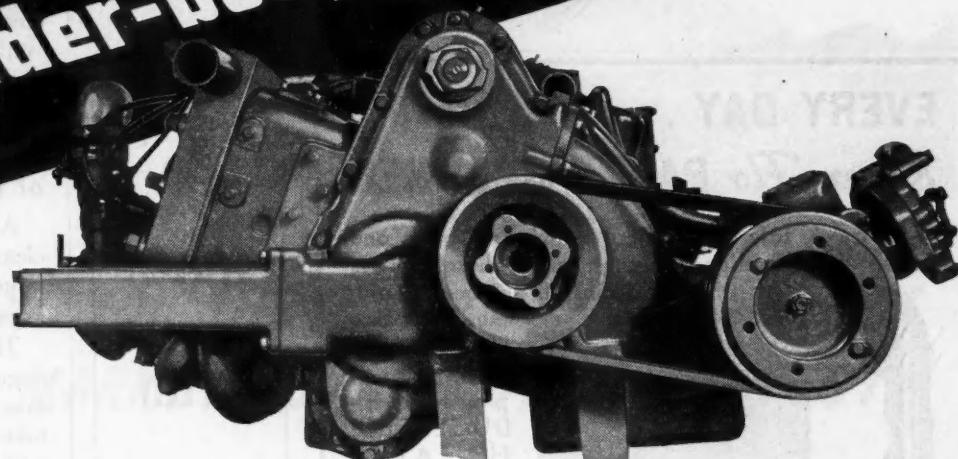
Col. J. M. Johnson Heads New Committee

Colonel J. Monroe Johnson has been appointed, with the approval of the President, head of a committee "to receive and pass upon applications for the holding of group meetings after Feb. 1 which are to be attended by more than 50 persons to determine if the need for these meetings is sufficiently in the war interest to warrant the tax on transportation and services. Other committee members are Under Secretary of War Robert P. Patterson, Under Secretary of Navy Ralph A. Bard, Chairman of the War Production Board J. A. Krug, and Deputy Chairman of the War Manpower Commission Charles M. Hay.



Waukesha Engine powered bus, built by Kenworth Motor Truck Corporation, Seattle, Washington, for the Gray Line Sightseeing Tours.

hauls more payload...with **WAUKESHA** Under-body Bus Engine



Inclined installation view
of Model 6-MZR Waukesha
Engine—6 cylinders, 4½ in.
bore, 4¾ in. stroke, 404 cu.
in. displacement.

- In the sightseeing buses of the Gray Line, passenger carrying capacity is payload.

But it takes power to move the payload—and space must be provided for the engine.

How to get full application of interior space for maximum passenger capacity—with a level floor—and without sacrificing any servicing convenience or valuable construction features?

That's the way the problem added up. But it didn't have the bus builders stopped...for long. Kenworth Motor Truck Corporation engineers found the answer—with Waukesha Engines, and the help of Waukesha engineers.

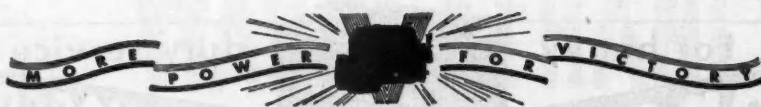
A standard Model 6-MZR Waukesha Engine was

converted for inclined installation—and mounted under the floor. The major parts of the standard Waukesha vertical engine are used with a few special adaptations made by Kenworth. And the engine is just as easy to service in its inclined position.

Close co-operation between Kenworth engineers and Waukesha's engineering development staff proved the feasibility and efficiency of this installation. And together they worked out the essential details that insured its successful operation.

Consult Waukesha engineers now about your special problems and future engine needs.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES



WAUKESHA ENGINES

HIGHWAY SAFETY APPLIANCES, INC.
2429 UNIVERSITY AVENUE • SAINT PAUL 4, MINNESOTA

UL
Listed Under
REEXAMINATION SERVICE
Underwriters' Laboratories

EVERY DAY . . . You Need a Kleer-Flo PARTS CLEANER

—for quick, safe, mechanical cleaning of parts and tools. Fluid pumped through metal hose, sprays parts, drains off dirt and grease, then flows thru filter. AVOIDS LOSS of small parts. REDUCES FIRE HAZARD. Safety link closes lid at 160° F.

SPEEDS WORK
SAVES TIME
CUTS COSTS

Kleer-Flo
CLEANING
COMPOUND

Efficient, fast-drying

MODEL KS20
Size 24x36"
Capacity 20 gal.
Write for information.

PRACTICAL PRODUCTS CO.
2632 Nicollet Ave.
Minneapolis 8, Minn.

Be
100%
With
10%
•
Buy
War
Bonds

1944 Ceilings On Used Vehicles To Continue

The prevailing 1944 price ceilings on used commercial motor vehicles will be continued throughout 1945, and present used passenger car prices will be maintained until July 1, 1945, under the terms of late amendments to OPA Maximum Price Regulations Nos. 341 and 540, respectively.

Used commercial vehicle ceilings were scheduled to be dropped to the next older model year ceiling price at the beginning of the new year, and used passenger car ceilings were to be reduced by four per cent each six month period. The continuance of the present ceilings for both used commercial vehicles and passenger cars was considered necessary by OPA in order to keep the market stocked with the largest possible inventory that restricted production will permit.

Aeroil Publishes Bulletin of Hot Dip Tanks

A new catalog of hot dip tanks for cleaning and degreasing has just been issued by the Aeroil Burner Co., Inc., West New York, N. J.

The profusely illustrated eight-page bulletin contains complete specifications on the wide range of hot dip tanks manufactured by this company with capacities from 11 to 640 gal., fueled by city gas, manufactured gas, liquid petroleum gas, or kerosene.

Free copies of the new bulletin No. 288 may be obtained by writing to the manufacturer.

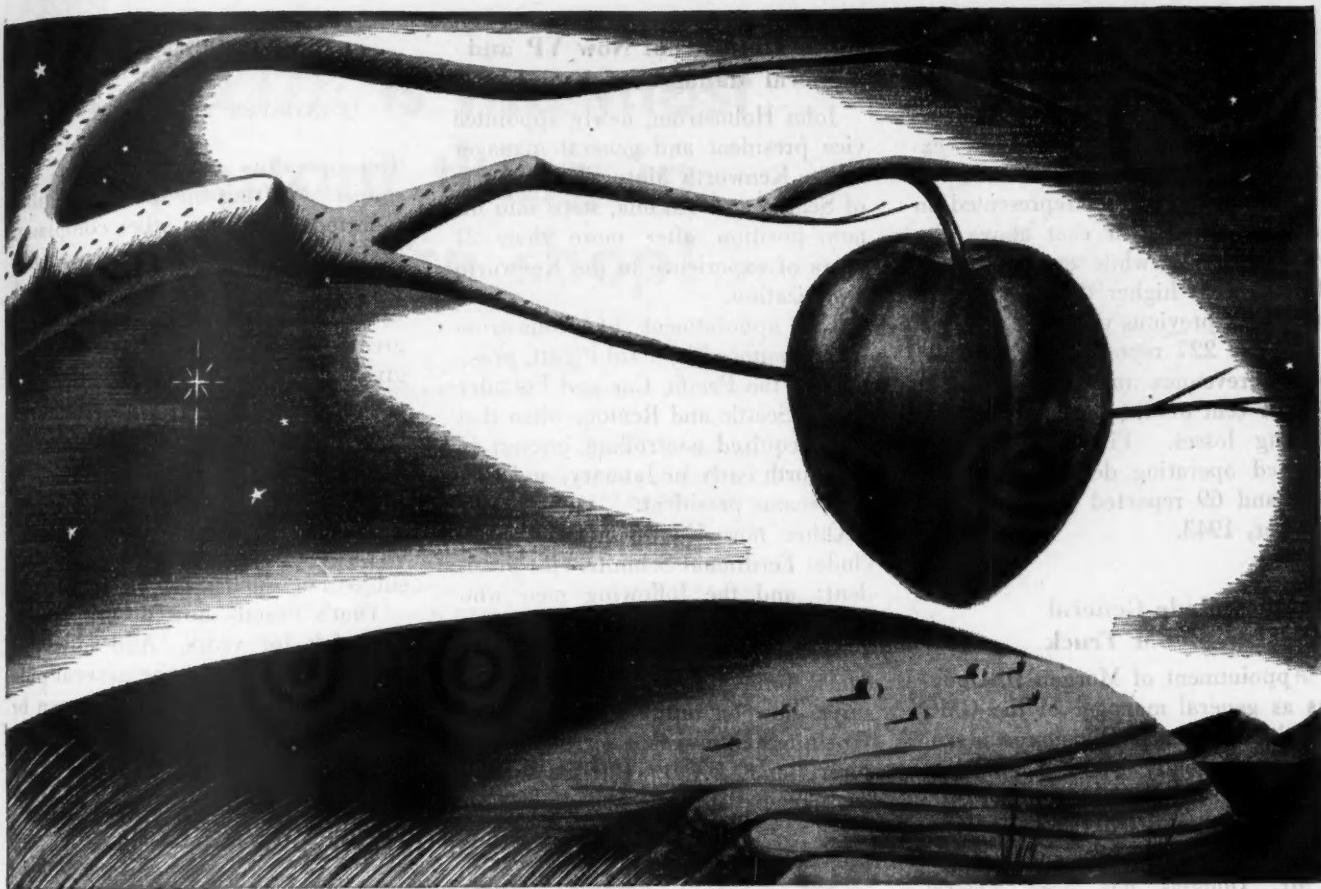
Neapco Issues New Catalog of Universal Joints

A new catalog, Neapco Replacement Universal Joints and Parts No. 46, is now available to dealers, parts men, and service men. In it are tables giving passenger car, truck, and bus applications; understandable illustrations; interchangeability data and the like.

KATHANODE
THE ORIGINAL SPUN GLASS BATTERY

For heavy duty service
FOR BUSES & TRUCKS

KATHANODE CORPORATION, Chicago, Ill.



BEEN RIPENING FOR THREE YEARS... THE HEAVY DUTY TRUCK MARKET NOW READY TO HARVEST!

● When civilian truck production was restricted by the War, the demand for heavy-duty motor trucks was greater than the available supply. Due to the increased burdens placed on motor truck transportation, this demand will continue to rise after the War. If you are a progressive

concern, anxious to increase your market and resulting profits, you will be interested in our selling plans for products backed by 25 years of truck manufacturing experience . . . You don't have to go out on a limb to enjoy added profits. A franchise may be available in your territory.

WRITE OUR SALES DEPARTMENT TODAY



WARD LAFRANCE
TRUCK DIVISION
GREAT AMERICAN INDUSTRIES, INC.

ELMIRA, NEW YORK

CCJ NEWSCAST

(CONTINUED FROM PAGE 78)

per cent below October while expenses increased 1.2 per cent.

November revenues represented an increase of 3.6 per cent above November, 1943, while expenses were 4.8 per cent higher than in November of the previous year.

Of the 227 reporting carriers, 93 whose revenues amounted to about 37 per cent of the total, suffered operating losses. Fifty-five of them showed operating deficits for October, and 69 reported losses for November, 1943.

Douglas Made General Manager of GM Truck

Appointment of Morgan D. Douglas as general manager of the GMC Truck and Coach Division was announced recently by C. E. Wilson, president of General Motors. Mr. Douglas will succeed Irving B. Babcock, who recently resigned.

Mr. Douglas has been general parts and accessories manager of the Chevrolet Motor Division since 1929. He also has been general manager of the General Motors Parts Division since 1933 and director of parts distribution for General Motors War Products.

Mr. Douglas was born in Chicago in 1891 and attended the Detroit University School and the University of Michigan, where he studied mechanical engineering. Starting with Chevrolet thirty years ago as a retail salesman, he was an assistant zone manager, a zone manager, a regional sales manager and assistant general sales manager.

Mr. Douglas is married and is the father of two sons. He lives on West Pine Road near Pontiac, Mich.

Packard Plans To Enter Truck Field

Packard Motor Car Co. is planning to enter the truck engine field after the war, according to George T. Christopher, president. The engine will be a 6-cylinder, 400-hp. adaptation from the 1500-hp., 12-cylinder marine motor the company now is building. It will be for use in 10-ton trucks. Christopher says the company has been negotiating with several truck manufacturers.

John Holmstrom Now VP and General Manager of Kenworth

John Holmstrom, newly appointed vice president and general manager of the Kenworth Motor Truck Corp. of Seattle and Yakima, steps into his new position after more than 21 years of experience in the Kenworth organization.

The appointment of Holmstrom was announced by Paul Pigott, president of the Pacific Car and Foundry Co. of Seattle and Renton, when that firm acquired controlling interest in Kenworth early in January, and Pigott became president.

Other new Kenworth officers include: Ferdinand Schmitz, vice president; and the following men who have long been associated with Kenworth: Vernon A. Smith, vice president; John Cannon, secretary-treasurer, now on military leave; K. T. Worthington, assistant secretary-treasurer, and F. D. Pitts, assistant secretary-treasurer.



H. G. Barnes, left, formerly president of Motor Power Equipment Co., St. Paul, succeeds Herbert King as vice president in charge of sales of the National Battery Co. and its Gould Commerical Division

Paul J. Carlsen, right, has been appointed vice president in charge of manufacturing of the American Container Corp., St. Paul, a National Battery Co. subsidiary



Frank J. Hasselman has been appointed assistant general sales manager for the St. Paul Hydraulic Hoist Co., Minneapolis

Lt. Col. James E. Boudreau has been appointed advertising manager of Ethyl Corp. He has been released from duty with the Sixth Service Command



EDITORIAL

(CONTINUED FROM PAGE 37)

fleet operators and their shop personnel. "Lifting up the hood," they reported, "there are other complaints in large numbers which presumably are not the responsibility of the stylist but they certainly deserve much greater attention than they have been given. Examples are inaccessibility of radiator hose connections and drain cock, virtual impossibility for owner to change the fan belt in his own car, inaccessibility of starter, generator, water pump, fuse or cutout box, battery. We do feel strongly on this subject!"

That's exactly how fleet operators have felt for years. And now that they know they have the general public on their side, perhaps they can be a little more insistent with car manufacturers.

END

(Please resume your reading on P. 38)

Dean Gilliespie Appointed To House Committee

Dean Gilliespie, Congressman from Denver, Colo., and the largest motor truck dealer in the country, has made a new record in Washington. He has just been appointed to the House of Representatives Appropriations Committee. It is extremely unusual for any representative to be put on this important committee until he has served several years in the House. Dean Gilliespie was elected to fill an unexpired term and then was re-elected in the last election.

Delco-Remy Offers New Electrical Service Slidefilm

Delco-Remy has recently completed a new 35-mm. sound slidefilm entitled "Electrical Service" that outlines in detail a checking procedure embracing all the major electrical units on the car.

The checking procedure begins at the battery, continues with the regulator, the generator, the cranking motor and the ignition system. The various checks and adjustments of these units as well as corrections of troubles are detailed. The film requires 30 min. to run.

(TURN TO PAGE 242, PLEASE)

Oil film is the most important thing in your service shop!

THINK! Why is it that every metal bearing surface in every motor in every truck or bus you maintain would *seize* if it were not protected by oil film?

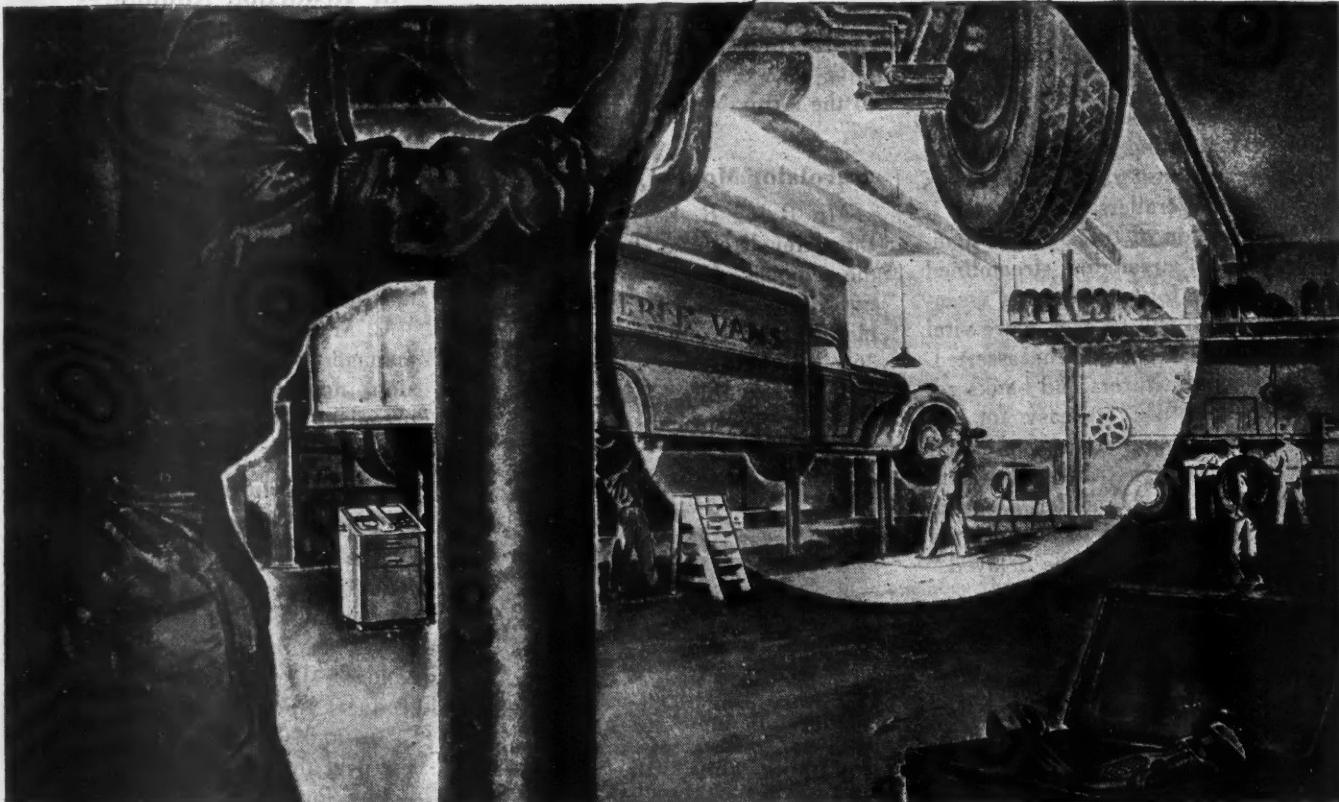
How is it that an almost inconceivably thin film of oil can withstand conditions of heat, pressure and sliding friction that no metal can endure? Not even scientists have the complete answer. But you service men know that good oil does mean everything to motor life—motor oil that can be depended on for efficient and lasting lubrication.

Quaker State HD Oil has the extra efficiency and lasting power that you need so urgently today. More—it has a most unusual ability to keep motor bearing surfaces clean.

**QUAKER STATE
HD OIL**

AND QUAKER STATE SUPERFINE LUBRICANTS

Quaker State HD Oil for your trucks, buses and tractors
Quaker State Motor Oil for your passenger cars



QUAKER STATE OIL REFINING CORPORATION • OIL CITY, PENNSYLVANIA

CCJ NEWSCAST

(CONTINUED FROM PAGE 240)

ATA Chief Advocates More Liberal Financing

Abolition of archaic state laws restricting free flow of interstate commerce by motor trucks and trailers, and a streamlined financing setup for truck-trailer operators by vehicle manufacturers and banks were listed as major problems of the nation's trucking industry by Ted V. Rodgers, president, American Trucking Association, addressing the annual meeting of the Truck-Trailer Manufacturers Association in Washington, D. C. Mr. Rodgers said that restrictive size-and-weight state laws affecting motor transport have been suspended as an emergency measure during the war, but pointed out that these laws, which are slated for enforcement in many states when peace is declared, will hamstring recovery in the post-war years by skyrocketing costs of truck-trailer operation—costs that will ultimately be handed on to the consumer.

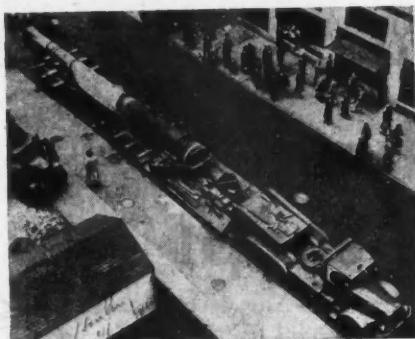
Advocating more liberal financing arrangements by truck-trailer manufacturers and banks, Mr. Rodgers declared: "I have found some bankers pitifully ignorant of trucks and trailers and their importance to the national economy.

"Nevertheless, in many sections, bankers are becoming 'educated' as to the tremendous value of motor transport with the result that some banks are granting longer term loans and lower interest rates to operators of trucks and trailers.

"Cooperation of truck-trailer manufacturers in arranging streamlined finance plans for operators is essential today and will be even more vital in the post-war period," he asserted. "Unless manufacturers and banks get together and make it easy for the little fellow to purchase trucks and trailers, the motor transport system in this country will suffer a severe setback and the victory for which we are all striving for will be delayed."

Exide Names Lighton VP

Lester E. Lighton, manager, Department of Development and Design, The Electric Storage Battery Co., Philadelphia, was recently elected vice president in charge of engineering.



This 70-ton gun from the battleship Texas, was moved from the Brooklyn Navy Yard up fashionable Fifth Avenue to its point of display near Radio City during the Sixth War Loan Drive. Gerosa Haulage of New York, with one of its six-wheeled Mack trucks, considered the job all in the day's work. The complete set-up measured 85 ft. 10 in. in length

GMC Atlanta Plant Producing Civilian Trucks

The Atlanta plant of Chevrolet Motor Division of General Motors has started production of several hundred trucks a month for civilian use. Monthly production schedules are being predicated on military and civilian truck allocations as agreed upon by OPA and military officials.

American Hammered 4-Star

American Hammered Piston Ring Division of Koppers Co., Inc., joins the highly "exclusive" ranks of automotive industry manufacturers who have earned their fourth star award to the Army-Navy "E" flag.

Purolator Moves Offices

Mr. Ralph R. Layte, president of Purolator Products, Inc., announced the removal of the company's executive and general offices from its plants at 365 Frelinghuysen Ave. and 362 Elizabeth Ave. to the National Newark Building, 744 Broad St., Newark, early in February.



This train combination which would be illegal in most states east of the Rockies, consists of two Fruehauf semi-trailer units with a converter dolly. Ten such Fruehauf trains are used by the Clark Bros. Motor Transport System of Watsonville, Cal.

Trailer Manufacturers Group Re-Elects Officers

At the Fourth Annual Meeting of the Truck-Trailer Manufacturers Association in Washington, the following officers and directors were re-elected:

President, E. J. Lucas, Kingham Trailer Co.; eastern vice-president, J. L. Glick, Truck Engineering Corp.; western vice-president, A. R. Trombly, Trombly Truck Equipment Co.; treasurer, H. N. Brown, Keystone Trailer and Equipment Co. Directors, N. A. Carter, Sr., Carter Manufacturing Co.; Charles Swingley, The Trailmobile Co.; L. A. Myers, Jr., Black Diamond Trailer Co., Inc.; Christopher Hammond, Jr., The Steel Products Co., Inc.; Bert P. Bates, Highway Trailer Co.; P. M. Heinmiller, Utility Trailer Mfg. Co.; R. R. King, American Body & Trailer Co., and Harrison Rogers, Rogers Brothers Corp., serving his first term.

There were 65 trailer manufacturers and trailer component manufacturers present for the meeting. The attendance at the annual dinner was 131 members, associate members, and guests from the various government agencies and from other associations in Washington interested in highway development.

Air Reduction Announces New Sales Appointments

The following appointments have been announced at Air Reduction of New York:

H. F. Henriques, formerly sales manager of the north central division, now general sales manager.

J. J. Lincoln, formerly sales manager of the south central division, now director of sales services.

C. M. Bloodgood, serving as sales manager of the Pacific Coast division, now is assistant to the vice president in charge of sales.

Willys-Overland War Products Increase 32%

The largest volume of sales and deliveries in the company's history was announced recently by Willys-Overland Motors, Inc., makers of the famous "Jeep." Deliveries of war products amounted to approximately \$236,700,000, an increase of 32 per cent over the corresponding figure of the previous fiscal year.

(TURN TO PAGE 244, PLEASE)

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WHEN new tires are so hard to get, making the old ones wear longer is a necessity.

Dealers tell us that a Mohawk Truck Tire, not seriously injured, is good for at least two new treads and that its life is materially lengthened when Mohawk Recapping Stock is used.

Actually, fleet owners report they can get the life of two new tires for only 60% of the price of one by having their tires recapped with Mohawk materials.



MOHAWK Recapping Materials *provide the Life of*

2 NEW TIRES FOR 60% OF THE PRICE OF ONE

Mohawk specialized on truck tire recapping stock long before the war. This had become a large business—one on which Mohawk had established a reputation.

Dealers using Mohawk materials now have ample supplies to give you immediate service.

If you can get Mohawk Tires,
better buy them.

(That goes, too, for Mohawk
Recapping Materials.)

THE MOHAWK RUBBER CO., AKRON, OHIO

CCJ NEWSCAST

(CONTINUED FROM PAGE 242)

Fleet Survey Shows Demand Greatest for 12-14 Ft. Bodies

In order to utilize limited manpower and materials to the fullest extent in meeting the critical need for new truck bodies, Lindsay & Lindsay, Chicago, recently made a nationwide survey to determine which sizes of bodies would fill the greatest number of operator's needs.

When results of the survey showed that 12- and 14-ft. bodies were the sizes most urgently needed throughout the country, arrangements were made to fabricate Lindsay Structure parts for an inventory from which bodies in these sizes could be quickly supplied. This enabled the company to take full advantage of their mass production facilities with a minimum expenditure of manpower needed for critical war production, and, at the same time, provides operators with prompt delivery on urgently needed bodies.

Although the initial inventory covers bodies in only two lengths, Owen S. Lindsay points out that the interchangeability of Ls parts makes possible 32 different models from this stock.

The complete stock line comprises bodies in lengths from 9 to 24 ft., but the interchangeability of Ls parts makes possible 1152 different models from a basic inventory.

White Makes Changes in Eastern Region

E. F. Hobbins, eastern regional vice president of White Motor Co., announced the following management changes: Harold Rodgers, formerly Philadelphia business manager, was promoted to eastern region business manager; G. M. Bowden was moved from Washington to Philadelphia as business manager; E. R. Kinnebrew, formerly Washington branch manager, was moved to Philadelphia in the same capacity; C. I. Fraley, former Wilkes-Barre branch manager, was made Washington branch manager; W. B. Tierney, Philadelphia personnel manager, was promoted to Wilkes-Barre as branch manager.

In addition, L. J. Stager, formerly assistant accountant at the Newark

branch, was promoted to business manager of the Washington, D. C., branch. C. W. Dettrey was made service manager of the Philadelphia branch. He was recently discharged from the army, having been a captain at the Army Ordnance Depot at Salt Lake City.



John W. Burke, who has been appointed manager of the Chevrolet commercial and truck department

PERSONNEL CHANGES

L. C. James has been appointed manager of the automotive sales of the Glidden Co., Cleveland, Ohio.

Joe Staff becomes head of the new Tank Solvents Division just formed by the Petroleum Solvents Corp. of New York City.

Three appointments have recently been announced by the Stewart-Warner Corp., Chicago. They are: Arden LeFevre, to vice president and director of engineering of division 1 (alemite, instruments, and radio); Fred R. Cross, to advertising manager; George W. Oehlsen, Jr., to assistant director of engineering, division 1.

J. E. "Jim" Carhart has been named manager of the B. F. Goodrich tire conservation department. Carhart succeeds John T. Staker, new Pacific Coast manager.

Mr. D. C. Greene has been named district manager for Haskelite Mfg. Corp., in the New York area.

W. G. Mosher has been appointed district manager of the Fisk Tire Mfg. Co., Portland, Ore. branch, succeeding J. J. Davison, who has been transferred to a post in the Los Angeles district.

Andy Beard, veteran employee of the Pharis Tire and Rubber Co., Newark, Ohio, has been named manager of the company's Service Store.

George R. Morgan has been appointed factory representative for Walter Snow Fighters and Tractor Trucks in Minnesota, Iowa, Illinois, North Dakota, South Dakota, Michigan and Ohio.

J. G. Moore, merchandising representative of the Memphis branch of Fisk Tire Co., has been appointed district manager of that company in Cincinnati.

T. M. Birmingham has been appointed division manager of the southeastern territory for the Auto-Lite Battery Corp. Auto-Lite also appointed C. C. Babb as district representative in the Atlanta territory and A. B. Wuerfel as district representative in the Hartford, Conn., territory.

Robert F. Coleman has been appointed district supervisor of the southern division for the merchandising division of The Electric Auto-Lite Co.

John C. "Josh" Billings has joined the truck and bus tire department of The B. F. Goodrich Co. and will handle sales of industrial and solid tires.

END

(Please resume your reading on P. 80)



The Bigge Drayage Co., Oakland, Cal., has been asked to perform about every transportation job in the book. This 18 ton, 45 ft. Navy rescue boat was

transported from Alameda to Pyramid Lake, Nev., and safely launched in that lake just three days after the emergency call came from the Navy.

COMMERCIAL CAR JOURNAL

THE MAGAZINE FOR FLEET OPERATORS

FEBRUARY 1945



VE PAPER . . . BUY BONDS!

Moving paper from pulpwood to press

It's a long haul from the pulpwood forests to your daily paper, but for two generations Reo has helped speed the way. Reo salutes the paper industry because it has so ably helped supply a news-hungry nation, as well as the many demands for a critical war material. With victory, Reo will be ready to channel its outstanding wartime truck production into practically all peacetime transportation needs. Meanwhile, ask your Reo dealer about Reo trucks for essential civilian service.

REO MOTORS, INC., LANSING 20, MICHIGAN

Factory Branches in Principal Cities

REO
1904 • AMERICA'S TOUGHEST TRUCK • 1945

YEAR after YEAR after YEAR, Dodge Owners Say,

"TRUCKS THAT FIT THE JOB...LAST LONGER!"



BUY WAR BONDS

This Dodge has delivered 430,700 miles . . . it's still giving dependable service!

"My eleven Dodge trucks have been on the road day and night since Pearl Harbor," writes Royce Nix of Texarkana, "hauling lumber and heavy machinery for aircraft production. "This one's rolled up over 430,000 miles, and that's typical of the long service I get from all my Dodge trucks. Trucking is my business," continues Mr. Nix, "so I watch operating costs like a hawk. They've got to be low or I couldn't stay in business!"

"Here's another thing—we've never been held up for lack of parts. And we can have needed parts installed without a lot of trouble and

expense—that's because Dodge trucks are *built that way!*"

Do you want that kind of hauling equipment? Then see your Dodge dealer—now—about trucks to fit *your job* . . . trucks to give you more dependable, longer-lasting, MORE ECONOMICAL transportation.

* * *

NOW AVAILABLE IN $1\frac{1}{2}$ AND 2-TON CAPACITIES

Dodge is building new $1\frac{1}{2}$ and 2-ton trucks in limited quantities for essential use. See your Dodge dealer for the right Dodge *Job-Rated* truck to fit your job. It'll save YOU money!

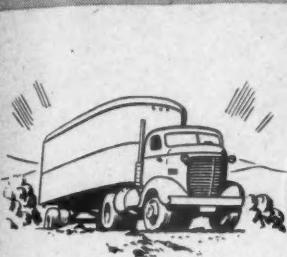
DODGE DIVISION OF CHRYSLER CORPORATION

TUNE IN MAJOR BOWES, CBS, THURSDAY, 9 P.M., E.W.T.

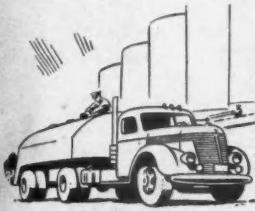
DODGE *Job-Rated* TRUCKS

FIT THE JOB...LAST LONGER

THE TRUCKING INDUSTRY HAS CONTRIBUTED TREMENDOUSLY TO WAR PRODUCTION



In the 11 western states, approximately 90% of all franchise-operated, long-line, heavy-duty, diesel-driven trucks are powered with Cummins Diesels . . . the bulk of them Model H's.



Some 21 manufacturers of heavy-duty trucks offer Cummins Diesels—including the Model H—as standard or optional original equipment.

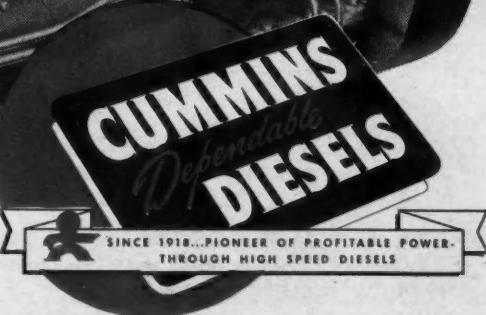


In industrial haulage, as on the highways, Cummins Diesels dominate the power picture. Example: On the Iron Range, more than 80% of the rubber-tired earth and ore moving equipment is Cummins-powered.

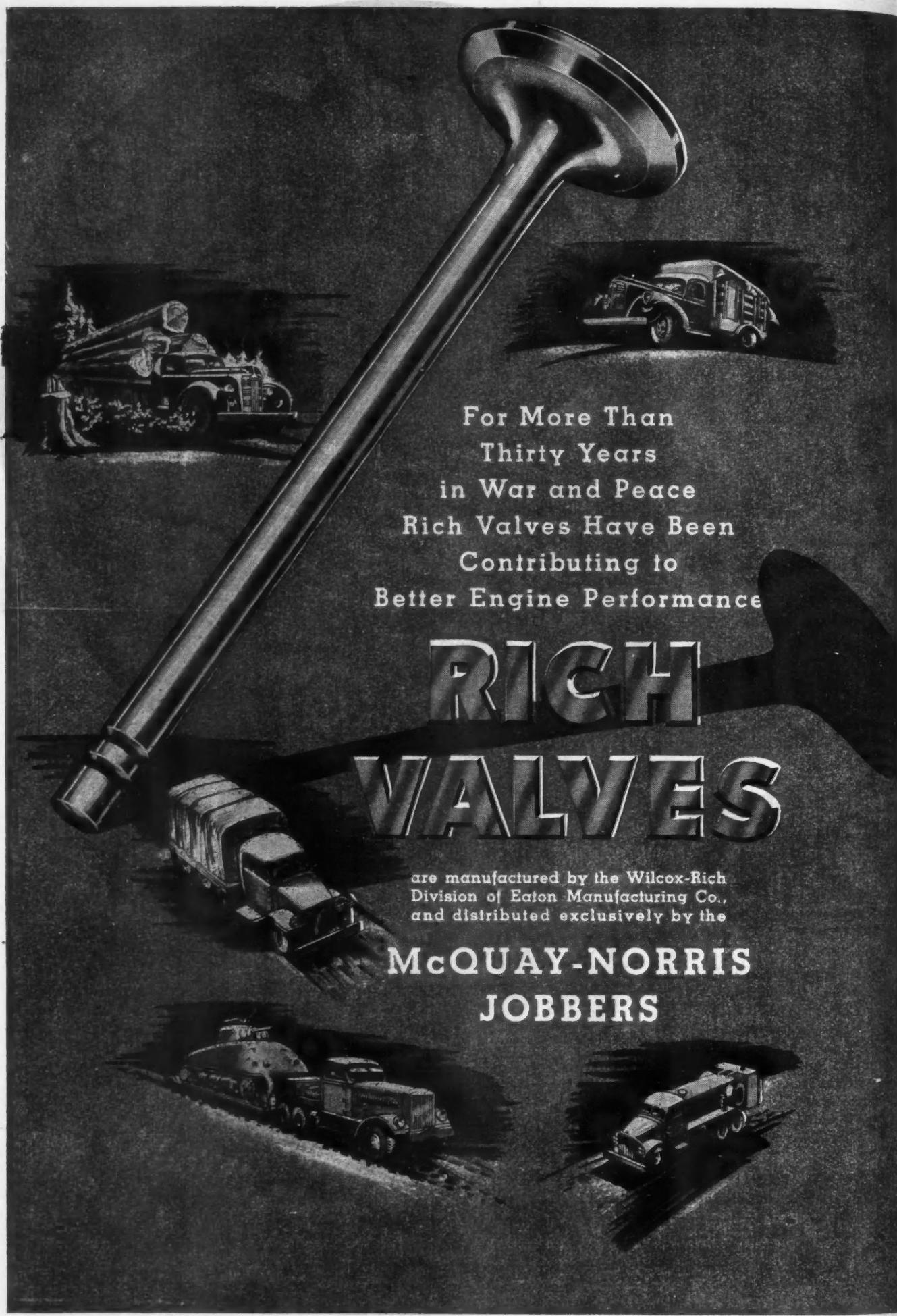


Good-Yesterday-Today-Tomorrow

Now in its 13th year of heavy-duty automotive service and crowding the billion-mile mark in proved performance, the Model H Cummins Diesel—the original high speed diesel—is still kingpin of the highways. Tomorrow, there will be newer, more powerful Cummins Diesels to handle the load requirements of the larger trucks that are coming up. But that does not mean the passing of the Model H because, by any standards—yesterday's, today's or tomorrow's—"old Model H" is a good engine . . . a proved engine . . . an engine that will continue to give America's fleet owners faster, cheaper trips for a long time to come. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.



SINCE 1918...PIONEER OF PROFITABLE POWER
THROUGH HIGH SPEED DIESELS



For More Than
Thirty Years
in War and Peace
Rich Valves Have Been
Contributing to
Better Engine Performance

RICH VALVES

are manufactured by the Wilcox-Rich
Division of Eaton Manufacturing Co.,
and distributed exclusively by the

**McQUAY-NORRIS
JOBBERS**

HOT OR COLD—THAT
CYLINDER WALL
IS PROTECTED!

Says
Permatex
Pete...



"ONE QUART OF PERMATEX TOON-OYL
MIXED WITH CRANKCASE OIL PROTECTS AGAINST
EXCESSIVE WEAR . . . *Summer or Winter*"

That cylinder wall and the piston rings "get the works" when the oil is like molasses in cold weather or thin like water in the summer-time.

Permatex Toon-Oyl mixed with any crankcase oil clings to metal surfaces. It protects cylinders from scoring, rings from wearing, valves from sticking and bearings from burning.

Use it in your tune-up work . . . and sell it to your customers.

Send for Permatex Toon-Oyl Manual, "Three Products in One" . . . filled with helpful information.

PERMATEX COMPANY, INC. • BROOKLYN 29, NEW YORK

FEBRUARY, 1945

Use postage-paid card inserted in this issue for free information on advertised products

3

COMMERCIAL CAR JOURNAL, Vol. LXVIII, No. 6. Published monthly by Chilton Co., N. W. Cor. Chestnut & 56th Sts., Philadelphia 39, Pa. Subscription price: United States and Possessions, Mexico and Latin American Countries, \$2.00 per year; Canada and Foreign, \$4.00 per year. Single copies 25¢, except April issue, \$1.00. Acceptance under the Act of June 5, 1934, authorized December 18, 1934.

"Lightning"



TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS

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COMMERCIAL CAR JOURNAL

M

FEB

Delivery



LADED together to form a strong, self-powered raft, two amphibious "ducks" quickly and efficiently transport a P-38 Lightning from ship to shore. This novel use of "ducks" for ferrying heavy cargo permits planes to be shipped overseas fully assembled, speeds their delivery to airbases in flying condition.

Trucks, like "ducks", are also carrying heavy cargoes these days... cargoes that call for efficient, full-power engine performance. To assure this, truck fleet operators everywhere use Texaco.

Texaco D-303 Motor Oil, for example, has the properties of detergency and dispersion. Detergency keeps piston rings and engine parts clean. Dispersion holds deposit-forming materials in suspension until normal drain periods. D-303 protects modern bearings and prevents scuffing of rings, pistons and cylinders.

For quieter-running, longer-lasting transmission and differential gears, use Texaco transmission and differential lubricants.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed below.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

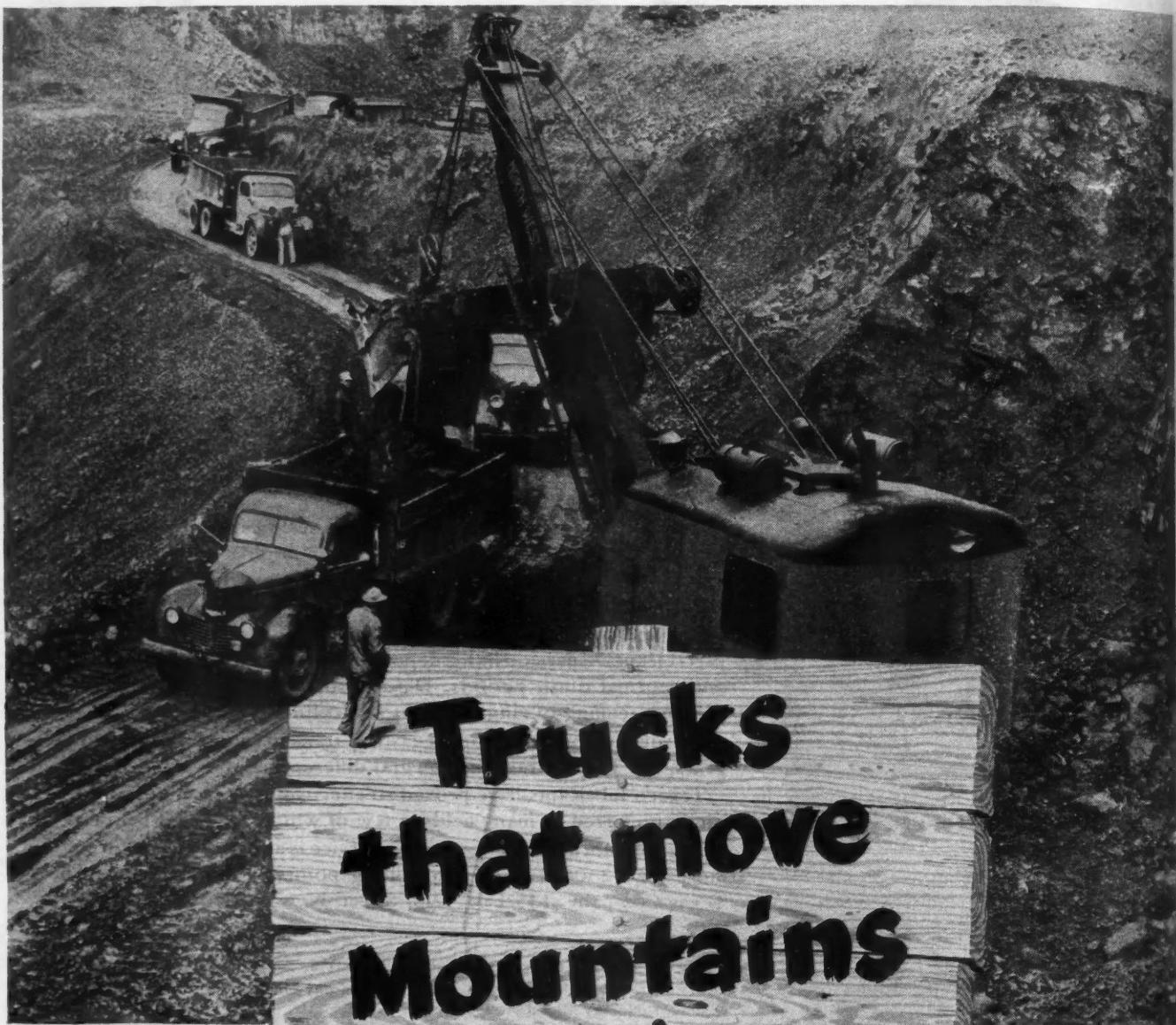
THEY PREFER TEXACO

- ★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.
- ★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.
- ★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.
- ★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.
- ★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

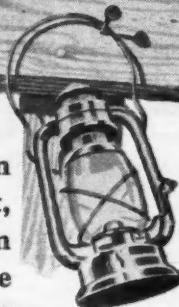
METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

FEBRUARY, 1945

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Trucks that move Mountains



For sixteen hours every day, seven days a week, month in and month out, these big Dodge dump trucks have been hauling granite to Port Hueneme on the West Coast. Their's has been one of the biggest hauling jobs in the world and one of vital importance to our country's war program.

For a job as rugged as this one, you need

electrical equipment that is built to stand up under punishment. These trucks have just such equipment. They are Auto-Lite equipped for dependable and lasting operation. Significant to every fleet owner is the number of tough war jobs, like this one, that offer conclusive proof the name Auto-Lite means precision manufacturing.



THE ELECTRIC AUTO-LITE COMPANY
TOLEDO 1, OHIO

AUTO-LITE

SPARK PLUGS • STARTING
LIGHTING • IGNITION
BATTERIES • WIRE & CABLE

TUNE IN "EVERYTHING FOR THE BOYS" STARRING DICK HAYMES—EVERY TUESDAY NIGHT—NBC NETWORK

Your Key to BETTER PERFORMANCE

*Analysis of Piston Ring Requirements
WITH
Recommendations*

Prepared for
JOHN DOE
Maintenance Superintendent
AMALGAMATED TRANSIT LINES
By the
Engineering Division
The Perfect Circle Company



Now that your fleet is doing a bigger job than ever, you need maximum performance from each unit.

One good way to maintain the best possible performance and reduce maintenance is by using the right combination of piston rings . . . for each specific make and model of truck . . . for the particular condition of the engine . . . for the specific type of service to which each engine is subjected.

And it's the right combination that Perfect Circle engineers recommend after an individual analysis is made of your fleet.

Under the new Perfect Circle Plan for Fleet Maintenance, results are: Longer periods between overhauls, lower oil and fuel consumption, better performance, lower over-all operating and maintenance cost.

Make the new Perfect Circle Plan a part of

your fleet operation. Today you need it more than ever.

A Perfect Circle Engineer will gladly cooperate with you in making a survey of your fleet. Call your Perfect Circle distributor or write The Perfect Circle Companies, Hagerstown, Indiana, U.S.A. or Toronto, Ontario, Canada. There is no obligation, of course.

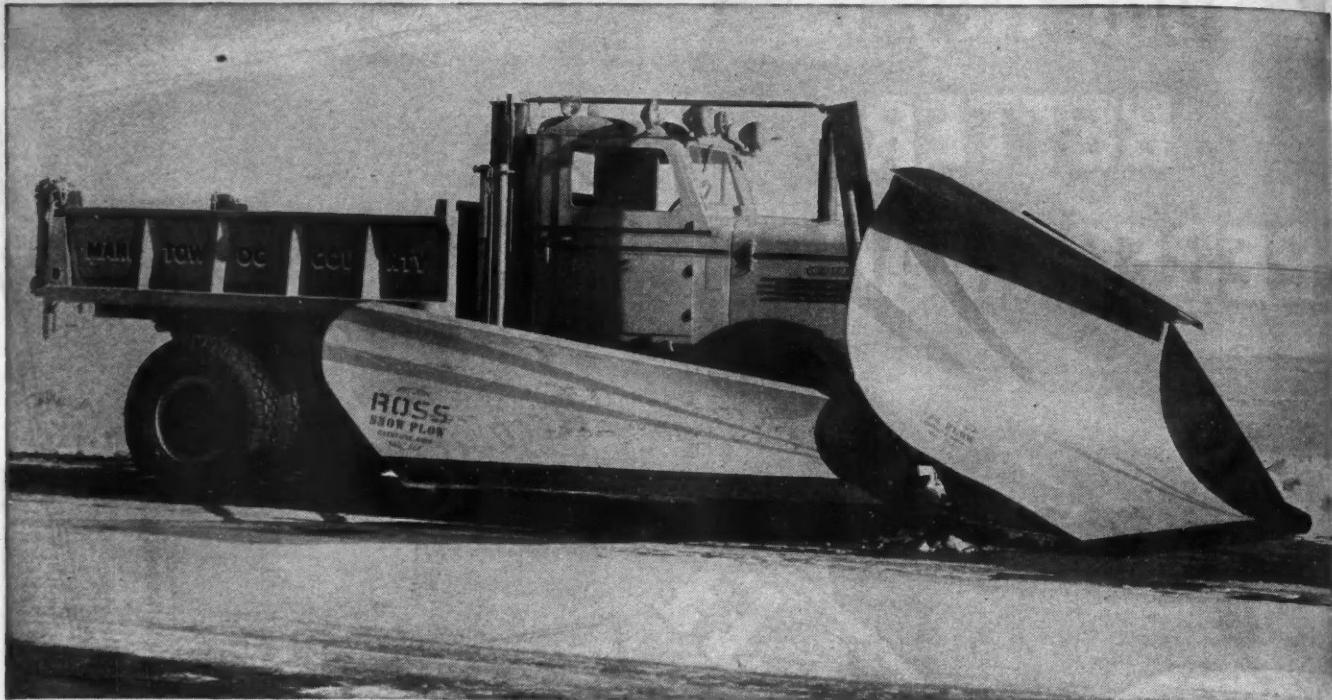
Co-operate with ODT Preventive Maintenance—Help Shorten the War

PERFECT CIRCLE
PISTON RINGS
The Nation's Choice

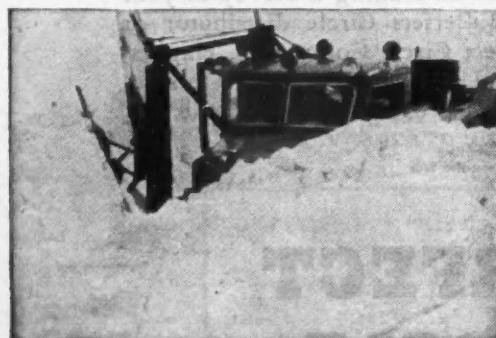
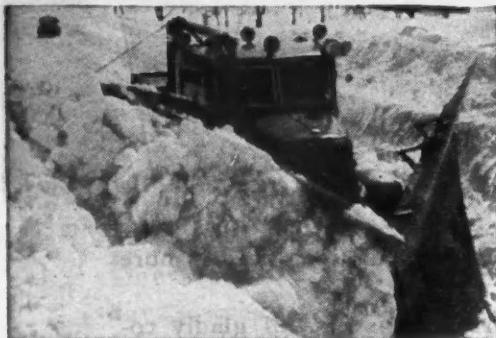


"For Excellence in War Production"

OSHKOSH 4 WHEEL DRIVE



OSHKOSH EQUIPMENT NOW AVAILABLE to Highway Departments and Airports



WITHOUT slowing up our deliveries to the armed forces, we are authorized to produce a limited number of trucks for essential civilian use.

Snow removal units are now being delivered to State and County Highway Departments and to Airports.

With its twenty-seven years of four-wheel drive engineering, Oshkosh equipment provides efficient power, rugged durability and economical operation for snow removal, maintenance and heavy construction work.

Write for descriptive literature

BUY MORE WAR BONDS

SERVICE STATIONS AT CONVENIENT POINTS THROUGHOUT THE U. S.

OSHKOSH MOTOR TRUCK INC., OSHKOSH, WIS.
CABLE ADDRESS: "OSHMOTOR" OSHKOSH



FROM THE STRATOSPHERE . . . BETTER SPARK PLUGS
FOR
BUSES AND TRUCKS!



For more than four years past, Champion Ceramic Aircraft Spark Plugs have been on active duty with our air forces, setting new records for long life and dependability. Extreme altitudes, extreme temperatures, 100 octane gas, and supercharging plus operating conditions in the high output engines themselves required new and revolutionary spark plugs, embodying materials and precision craftsmanship of an exceptionally high order. Today those same basic materials, fundamental design and exceptionally high manufacturing standards are yours, in Champion Spark Plugs, for individual buses, trucks, or fleets. Naturally, Champions bring an extra measure of dependability and efficiency to every engine. Champion Spark Plug Company, Toledo 1, Ohio.

DEPENDABLE
CHAMPION
SPARK PLUGS



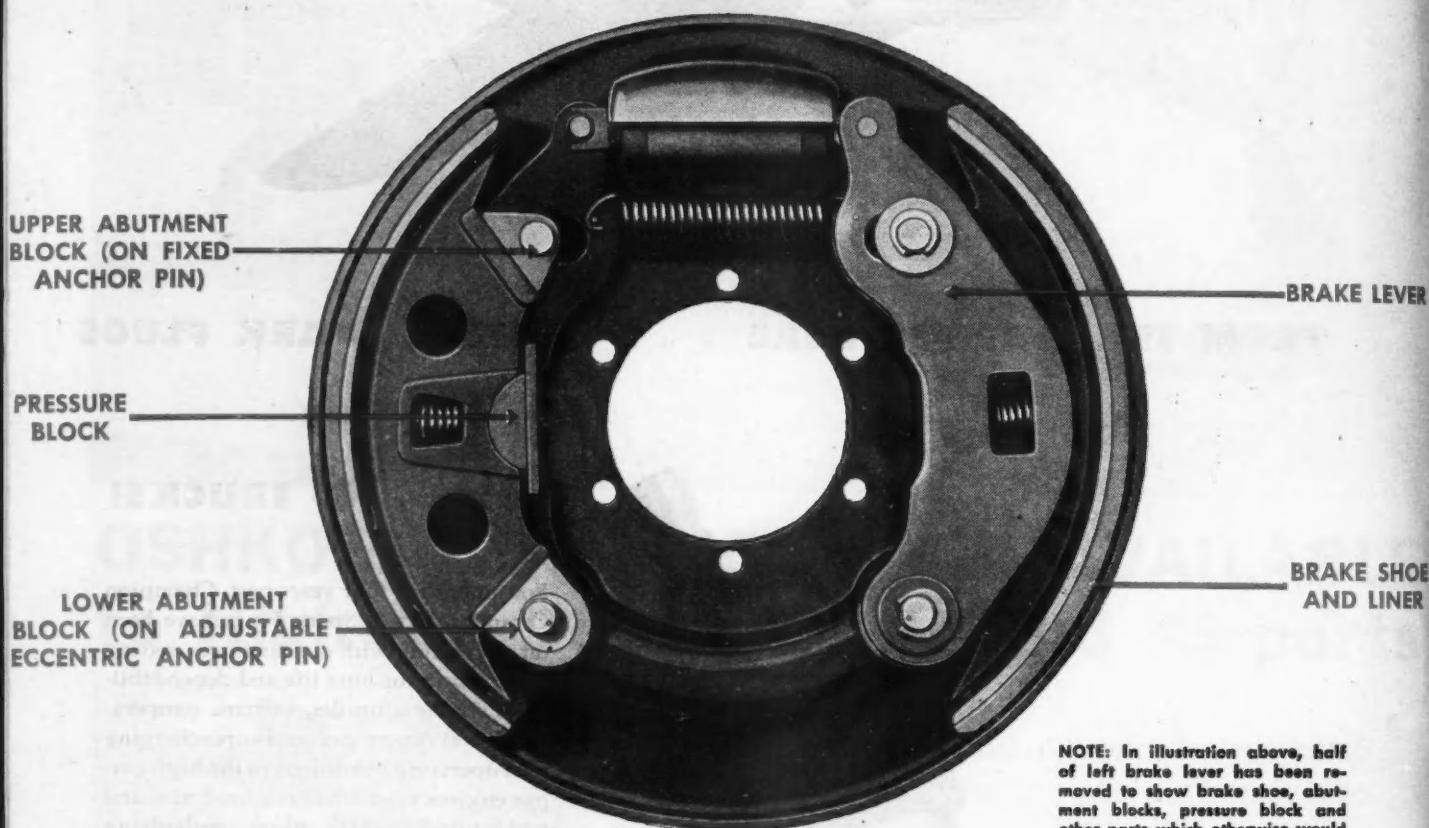
Buy More and More
War Bonds Until
the Day of Victory

The new

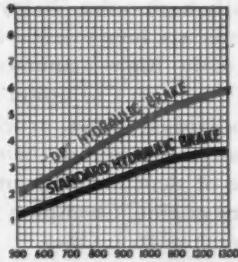
TIMKEN "DP" BRAKE

DUAL PRIMARY

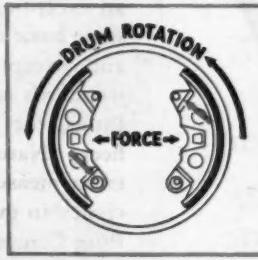
medium duty series for hydraulic actuation



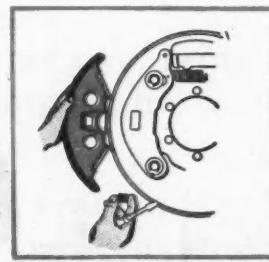
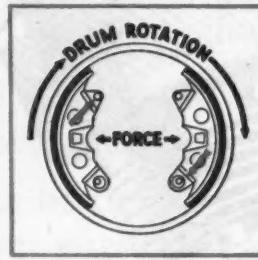
NOTE: In illustration above, half of left brake lever has been removed to show brake shoe, abutment blocks, pressure block and other parts which otherwise would be concealed from view.



30% to 35% greater braking ability at all hydraulic line pressures.



Both shoes are equally self-energizing, regardless of direction of drum rotation.



Shoes can be removed in a few seconds, with just a screwdriver.

Greater braking ability . . . longer liner life . . . complete driver control . . . utmost simplicity . . . equal effectiveness in forward or reverse . . . these and other features of the new Timken "DP" Brakes fully meet today's needs for the improved brake performance

demanded by heavier loads and faster schedules.

Timken "DP" Brakes are available on certain vehicles now being produced. Write for descriptive folder — see how perfectly these modern brakes meet YOUR needs!

38 YEARS OF AXLE ENGINEERING LEADERSHIP



T I M K E N A X L E S

THE TIMKEN-DETROIT AXLE COMPANY, DETROIT 32, MICHIGAN
WISCONSIN AXLE DIVISION • OSHKOSH, WISCONSIN

Whatever you call it... detergency dispersancy or peptizing action

**Stanolube HD has that quality
which keeps engines clean**

THE QUALITY in a truly HD (heavy-duty) motor oil that keeps engines clean has been given many names—detergency, dispersancy, or peptizing action are some. Regardless of the name you give it, *what* that quality is, and *why* it keeps engines clean, are of utmost importance to you.

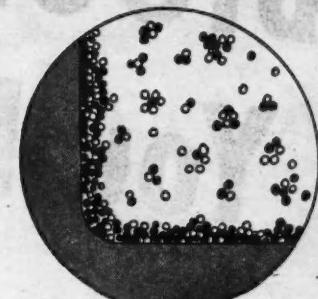
A simplified description at the right explains the difference between conventional, oxidation-inhibited motor oil, and those that have *both* added oxidation inhibiting and detergency or dispersancy properties—such as Stanolube HD. It explains why Stanolube HD keeps engines free from varnish and other engine deposits even under severe service demands.

You can get much more positive and convincing proof of the advantages of Stanolube HD by testing it on some of the hard-worked engines in your fleet. A Standard Oil Automotive Engineer will be glad to help you make such a test or show you actual fleets—perhaps near you—where Stanolube HD has provided clean engine operation when other oils have failed.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Automotive Engineer nearest you.

Cause of Engine Deposits Most troublesome engine deposits are caused by: (1) Fuel soot which originates in the combustion chamber and dust that enters the engine. (2) Oil deterioration products caused by excessive heat and agitation of the oil in the presence of oxygen. Both types of contaminants tend to accumulate more rapidly under heavy-duty service than in normal operation.

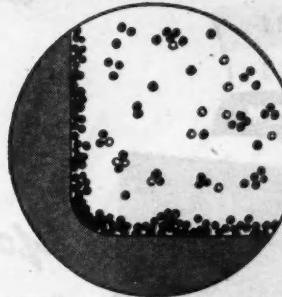
Why deposits occur in conventional oil



Fuel soot and dirt Oil oxidation products

The first diagram shows how these typical contaminants are theoretically present in a used conventional oil. They have a tendency to adhere to each other and settle out of the oil, depositing on engine surfaces such as crankcases, pistons, oil screens, oil lines, and bearings.

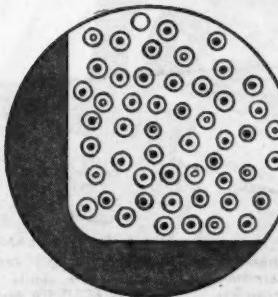
An oxidation-inhibited oil gives only partial protection



maining oxidation products from depositing in the engine.

The second diagram shows how oils appear with improved oxidation stability *only*. Oxidized oil particles are materially reduced. As a result, deposits are less heavy on engine surfaces. However, this does not prevent dust, fuel soot, and the remaining oxidation products from depositing in the engine.

Effect of an oxidation inhibitor plus a detergent in Stanolube HD



In order to render harmless *all* potential deposit-forming contaminants, Stanolube HD contains a combination oxidation inhibitor and detergent additive. The third diagram illustrates how the detergent theoretically surrounds all of the contaminants in the oil, including the small amount of oxidized oil present, with a film which prevents them from adhering to each other or to interior engine surface. It holds them in suspension in the oil until they are removed by filtering or draining, thereby eliminating troublesome deposits. A true heavy-duty oil has both detergency and oxidation stability.

Gasoline Powers the Attack... Don't Waste a Drop!

STANDARD OIL COMPANY (INDIANA)

**STANDARD
SERVICE**

★ FLEET CONSERVATION SERVICE

TO DO

the BIGGEST JOB You EVER HAD...

... USE *Thor* TOOLS

REPAIR THE CARS
WITH THE TOOLS
THAT BUILT THEM



Keeping present day cars and trucks in shape, until the new ones are ready—will be the biggest job repair shops ever had. Even after the manpower shortage ends, present-day cars will be just that much older, requiring more repair service.

Your Big Chance...

Between the time military needs cease and new automotive production begins, you'll be able to get Thor Pneumatic and Electric Portable Tools . . . the same sturdy, reliable tools that helped build every make of car on the street today. To take advantage of this situation, place your Thor Tool orders now so that your local jobber can give you, at the very first opportunity after Victory, the tools specifically designed for automotive shop service.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Blvd., Chicago 6, Illinois



ELECTRIC DRILLS
LIGHT AND HEAVY DUTY DRILLS in a complete range of capacities from $\frac{1}{4}$ " up to $1\frac{1}{2}$ " for continuous or intermittent service are available in the complete Thor line of portable electric tools.



ELECTRIC SANDERS & POLISHERS
THOR 7" AND 9" DISC SANDERS for all metal finishes are sturdy and easy to handle. A THOR POLISHER produces a brilliant durable finish, saves time and effort.



ELECTRIC GRINDERS
4", 5" AND 6" DIA. WHEEL
Portable Grinders for fast
grinding, wire-brushing and
buffing on all metal surfaces.



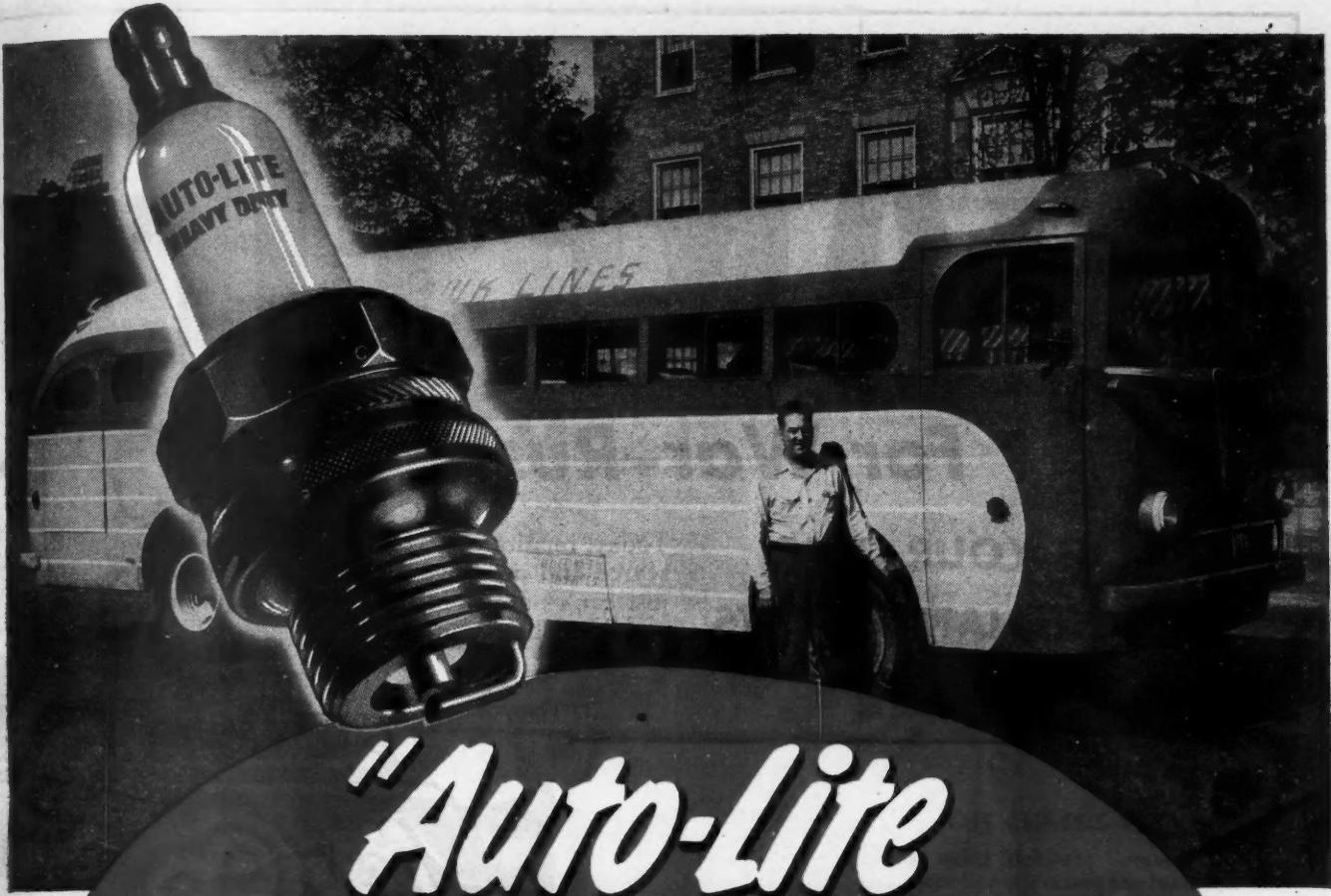
AN AIR TOOL FOR EVERY JOB...

HARNESS THE MAGIC POWER of Air . . . with THOR MULTI-MATIC AIR TOOLS for shop service. Run from compressor as small as 3 H.P. Complete line includes Drills, Grinders, Polishers and Sanders.



Thor
PORTABLE
Electric
TOOLS

Branches in Principal Cities



"Auto-Lite HEAVY DUTY SPARK PLUGS Outperform 3 to 1 FOR US"

says ROBERT GEDDES, Supt. of Maintenance, Black Hawk Motor Transit Co.

Buy
More
War
Bonds

"Spark plugs were being changed every 10,000 miles," reports Mr. Geddes, "but since we switched to Auto-Lite Heavy Duty Plugs we have not replaced a single plug. To date each plug has been used

over 30,000 miles." Switch to Auto-Lite Heavy Duty Plugs in your fleet and see how they help save time, trouble and expense. Ask your supplier, or write to

THE ELECTRIC AUTO-LITE COMPANY
TOLEDO, 1 • Merchandising Division • OHIO

Tune in the
AUTO-LITE
Radio Show
STARRING

Dick Haymes

Helen Forrest
Gordon Jenkins' Orchestra
EVERY TUESDAY NIGHT • NBC



AUTO-LITE SPARK PLUGS

IGNITION ENGINEERED BY IGNITION ENGINEERS

MAKE LIFE

For War-Rushed

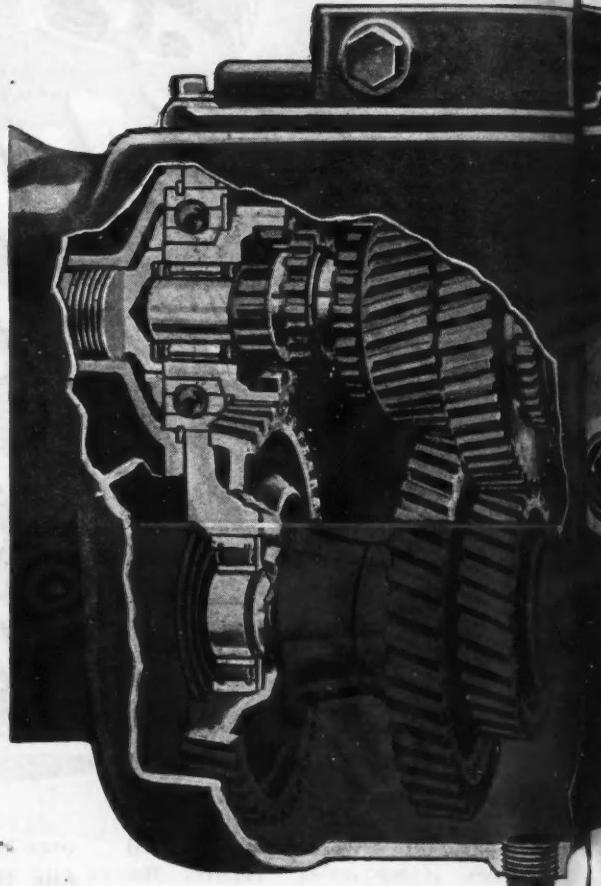
**CUT YOUR GEAR
MAINTENANCE COSTS**

Today, repairs cost you so much—in revenue miles, in scarce and precious maintenance manhours—that you just can't afford not to give your equipment the finest possible lubrication.



MINIMIZE WEAR, DEPOSITS, GEAR FAILURES!

Mobilube Gear Oils are exceptionally stable straight mineral oils—developed to meet the toughest heavy-duty requirements! Free of abrasives, soaps, fillers and other foreign materials. Give you quality protection!

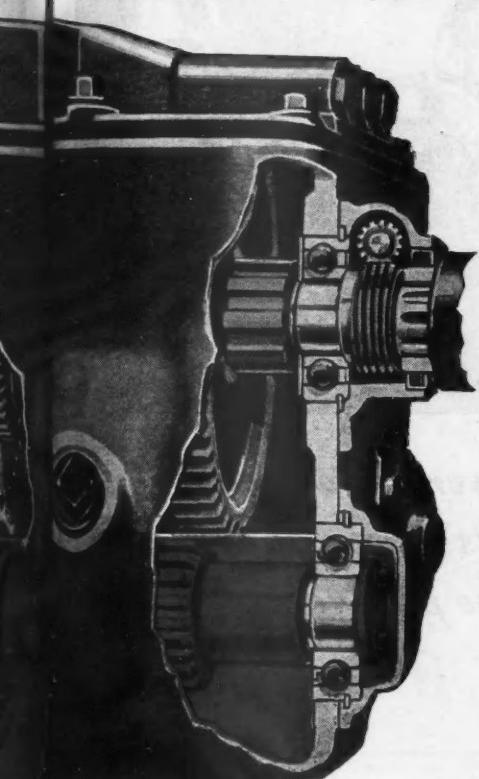


MOBILUBE

EASIER

Maintenance Men!

Mobilube Gear Oil is just one of the fine Socony-Vacuum products which prevent trouble—keep equipment on the job. See your Socony-Vacuum Representative for complete and scientific protection of every part of every vehicle.



MEAN EASIER SHIFTING!

When used in correct grades, Mobilube Gear Oils remain free-flowing in zero weather—prevent shifting difficulties, reduce wasteful "oil-drag"!

Gear Oils



FACTS

From Your Socony
Vacuum Representative



This man puts Socony-Vacuum's vast experience and resources to work for you. He not only brings you outstanding products... but expert engineering aid and other important helps.

REDUCE ENGINE MAINTENANCE

with Delvac Heavy-Duty Oils. These highly stable engine oils not only provide outstanding protection against wear... they have special detergent properties which minimize sludge, gum and "varnish" formation—reduce the frequency of engine cleanings! Also help prevent corrosion of hard-alloy bearings!

CUT CHASSIS TROUBLES

by using Mobilube Greases! This famous line of greases has been specially developed to meet the requirements of every piece of equipment you operate. Mobilube V is one of the best-known products in this line. Recommended for wheel bearings, grease-type universal joints, clutch release bearings and other parts subjected to high operating temperatures—this lubricant has proved its value in many fleets through outstanding performance in all types of service. It's recommended for year-around use!

IMPORTANT HELP FOR MAINTENANCE DEPARTMENTS

Your Socony-Vacuum Representative is now ready to bring you a completely new Preventive Maintenance Plan which not only works within the Maintenance Department—but enlists your drivers' active cooperation in the effort to cut down repairs—save money and valuable manhours.



A new booklet—a series of clearly written engineering bulletins—and big down-to-earth posters are included in the material you receive.

SOCONY-VACUUM OIL CO., INC.
and Affiliates: Magnolia Petroleum Co.,
General Petroleum Corp. of California.



JAMES SESSIONS paints his impression of Borg-Warner's Ingersoll plant at Kalamazoo. Here, where furnaces are made in peacetime, Borg-Warner-designed amphibian "Beachbusters" are now built by mass production methods.

Partners with the automotive industry from the start, Borg-Warner supplies these and other essential parts...

TRANSMISSIONS • TRANSFER GEARS
OVERDRIVES • SYNCHRONIZERS • CLUTCHES
CLUTCH SPRINGS
UNIVERSAL JOINTS AND DRIVE SHAFTS
FLUID COUPLINGS • CARBURETORS
RADIATORS • TAPERED WHEEL DISCS

ENGINEERING
BW
PRODUCTION

The appliances that make your home more livable . . . the automobile, airplane or boat that transports you . . . the food you eat . . . all bring Borg-Warner into your life.

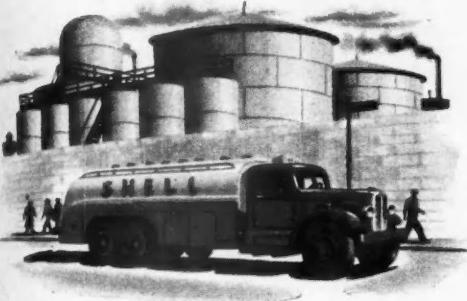
For, in peacetime, this company makes a truly astounding variety of essential products. And no matter what the product, Borg-Warner engineers are guided by this one basic principle:

"design it better—make it better."

Perhaps this explains why Borg-Warner has, for years, been privileged to work with other industries in developing ever better products at ever lower cost.

When America's production genius need no longer be concentrated on war needs, Borg-Warner will again work hand in hand with your industry in turning out the products of peace.

Peacetime makers of essential operating parts for the automotive, aviation, marine and farm implement industries, and of Norge home appliances . . . these units which form the Borg-Warner Corporation are today devoted exclusively to the needs of war: BORG & BECK • BORG-WARNER INTERNATIONAL • BORG WARNER SERVICE PARTS • B-W SUPERCHARGERS, INC. • CALUMET STEEL • DETROIT GEAR AIRCRAFT PARTS • DETROIT VAPOR STOVE • INGERSOLL STEEL & DISC • LONG • MARBON • MARVEL-SCHEBLER CARBURETOR • MECHANICS UNIVERSAL JOINT • MORSE CHAIN • NORGE • NORGE MACHINE PRODUCTS • PESCO PRODUCTS • ROCKFORD CLUTCH • SPRING DIVISION • WARNER AUTOMOTIVE PARTS • WARNER GEAR



HEAVY TANKAGE!

For the ruts of War or the highways of Peace, Autocar Trucks are precision-built for the heaviest of heavy-duty work. Mile after mile, day after day, year after year, these famous trucks put on dependable, low-cost-per-mile performance and reduce hauling and delivery costs for the nation's leaders. Ask Shell Union Oil Corporation. They know Autocar Trucks through long years of rugged use. Then follow the leaders, for they know the way!

AUTOCAR TRUCKS FOR HEAVY DUTY

MANUFACTURED IN ARDMORE, PENNSYLVANIA
SERVICED BY FACTORY BRANCHES FROM COAST TO COAST



Four-Time Winner
of the Army-Navy E



Lick The Truck Shortage The Way The Army Did!

If you find it hard to get the trucks you need, consider what the Army faced when war was declared. Realizing they could not get soon enough the tens of thousands of trucks needed, the Army carefully selected the type that would give them the greatest hauling capacity. They settled on the single-unit six-wheel truck because it enables them to carry up to twice the payload of a four-wheeler. Besides, it has outstanding advantages in maneuverability, traction, safety and flotation.

And you can lick the truck shortage the same way the Army did, if you have two axle trucks. Double their payload capacity by installing Trucktor Third Axles. The extra load per truck quickly becomes an all-profit load, because the Trucktor Third Axle is soon paid for and requires no maintenance.

THE TRUCKTOR CORPORATION, 156 Wilson Ave., Newark 5, N. J.

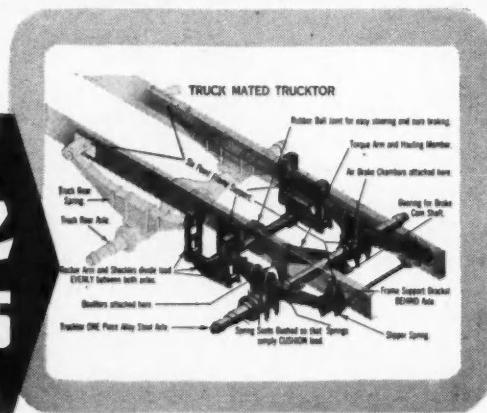


BEST OF THE FORTIES UNRATED

**NO PRIORITY IS NEEDED, SO ACT TODAY.
WRITE US FOR SPECIFICATIONS OF THE
TRUCKTOR MODEL FOR YOUR TRUCK.**

Trucktor

THIRD AXLES



TRUCKTOR CURBS UNEVEN TIRE WEAR

Scuffing, bouncing and twisting aren't such tire hazards on Truck-tored trucks. The Six Point Suspension spreads the load evenly, prevents undue wear on any tire. The Torque Arm eliminates hauling strains, keeps tires in line.



THE MOST CRITICAL TRUCK TIRE MONTHS OF THE ENTIRE WAR ARE HERE



Now you Must save the Carcass
to save your Business . . . and

GENERAL TIRE DEALERS ARE READY TO HELP YOU GET OVER THE HUMP

If you have thought the tire crisis was bad . . . but were getting by . . . this is a serious warning that the next few months will determine whether your trucks will continue to roll or will have to be laid up for lack of new tires.

Recognizing that it all depends on saving the carcasses of tires now on trucks,

General Tire Dealers are working their recapping shops day and night, giving priority to trucks lacking adequate spares and scheduling truck tires ahead of passenger tires.

With comprehensive coast-to-coast tire facilities . . . with the Kraft System, original factory-control recapping method exclusively in their shops . . . with factory-trained tire experts and the most modern equipment . . . General Tire Dealers are best equipped to help you maintain new tire mileage and to add thousands of miles to worn casings . . . and they are ready to help see you through.



Twin Signs of
Top-Quality

GENERAL TIRE
KRAFT SYSTEM
RECAPPING

KRAFT SYSTEM
KRAFTED
TIRE READING
REG. U. S. PAT. OFF.

BALANCED BRAKES
THE GENERAL TIRE
& RUBBER COMPANY
AKRON, OHIO

TO MAKE TRUCKS LAST, PUT QUALITY FIRST...

OR ELSE!

ACE PACKING COMPANY



YOUR JOB IS TO KEEP THEM ON THE ROAD

This is no time to skimp on the quality of the service-job you do, or on the parts you use for replacement. It's up to you, Mister, to keep them rolling for a long time to come.

Tune the engine to today's fuel to eliminate "pinging" and resulting sludge conditions. When you tear-down an engine, do the job properly. Replace all worn parts with the *best* quality replacement parts you can buy to restore full efficiency . . . to save oil and gas . . . and to prevent costly breakdowns.

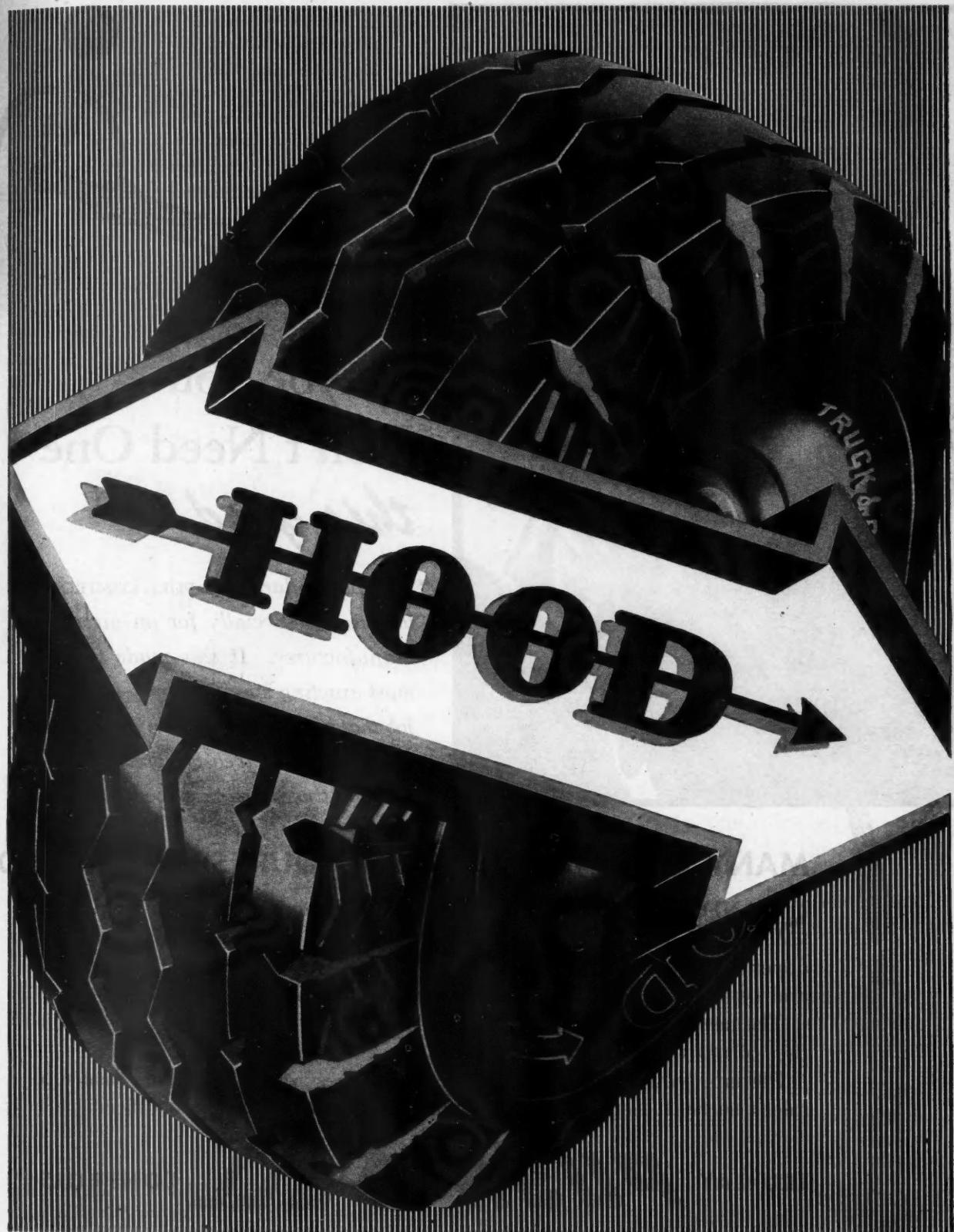
Do a good job on brakes, too... the control-center of every vehicle. Your Grey-Rock jobber has the latest brake-servicing information, including National Safety Council standards, to make your job easier, surer. He also has Grey-Rock quality balanced linings . . . for safe, sure stops . . . for longer wear. See him, too, for other quality parts and shop-services.

Now, more than ever, put quality *first* to make 'em last. UNITED STATES ASBESTOS DIVISION of Raybestos-Manhattan, Inc., MANHEIM, PA.

Grey-Rock
BALANCED BRAKSETS
BLOCKS
CLUTCH FACINGS
FAN BELTS • HOSE



ESSENTIAL PRODUCTS FOR ESSENTIAL TRANSPORTATION



FOR generations Hood has stood for tough, long-wearing truck tires. They're built big and brawny for hard work. Their carcass is made with Hood's exclusive Hi-density bruise-resistant cord. Their tread is deep,

broad, and rugged. Any way you look at it, they're tires especially designed for the man who wants extra miles of dependable, low-cost service. For if it's a HOOD tire, it's an extra GOOD tire.

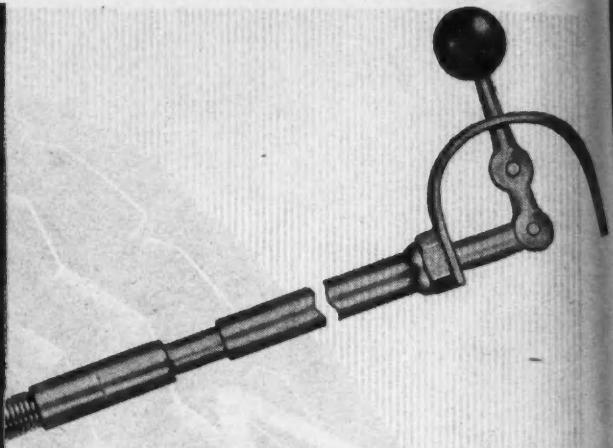
Synthetics require extra care... Start with the best.

HOOD RUBBER COMPANY
A Division of The B. F. Goodrich Company

Tire
Factories and Laboratories
Akron, Ohio, and Los Angeles, Calif.



Footwear
Factories and Laboratories
Watertown, Mass.



Maybe You Don't Need One *this good...*

"This particular PUSH-PULL CONTROL was made especially for an aircraft manufacturer. It was made to the most exacting specifications—to do a job that couldn't be done in any other way. Naturally it costs more. Maybe you don't need one this good."

MANY VARIATIONS TO FIT YOUR SPECIFIC NEEDS

STANDARD TRU-LAY PUSH-PULL is today serving in thousands of applications—automotive, aviation and industrial. It is providing smooth, dependable, positive remote control. In its many variations of size, length and type of fitting, standard PUSH-PULL will find new ways to serve.

The new *improved* TRU-LAY CONTROL will broaden still further the possible uses of TRU-LAY PUSH-PULL.

Perhaps you have a problem that involves remote control. PUSH-PULL might solve it. Let us discuss it with you. Write our Detroit office.

TRU-LAY PUSH-PULL CONTROLS

AUTOMOTIVE AND AIRCRAFT DIVISION

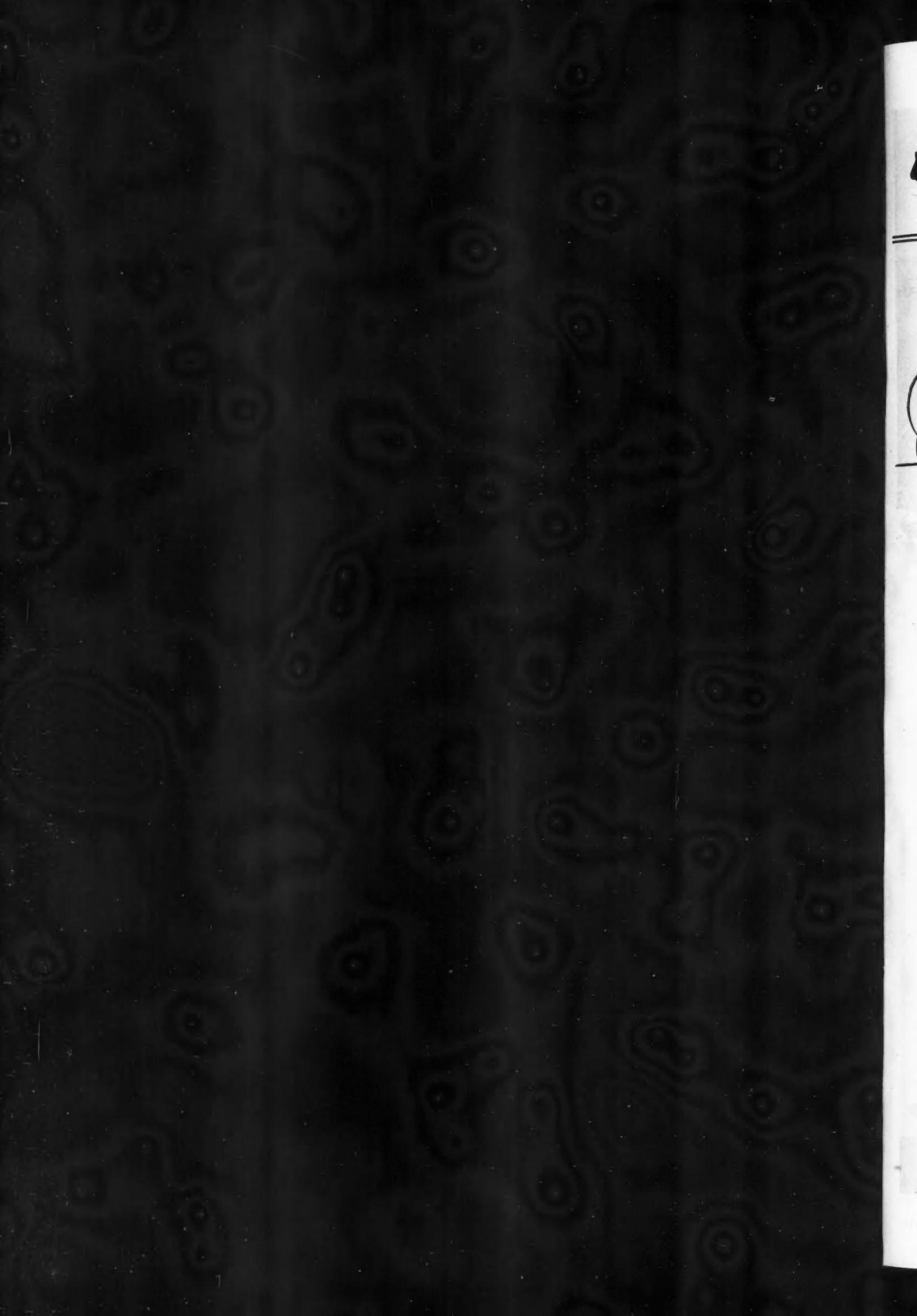
6-235 GENERAL MOTORS BUILDING, DETROIT 2 • 695 BRYANT STREET, SAN FRANCISCO 7

AMERICAN CHAIN & CABLE • BRIDGEPORT



ESSENTIAL PRODUCTS • TRU-LAY Aircraft, Automotive, and Industrial Controls • TRU-LOC Aircraft Terminals • AMERICAN CABLE Wire Rope •
TRU-STOP Brakes • AMERICAN Chain • WEED Tire Chains • ACCO Malleable Castings • CAMPBELL Cutting Machines • FORD Hoists, Trolleys •
HAZARD Wire Rope • MANLEY Auto Service Equipment • MARYLAND Bolts and Nuts • OWEN Springs • PAGE Fence, Shaped Wire,
Welding Wire • READING-PRATT & CADY Valves • READING Steel Castings • WRIGHT Hoists, Cranes • WILSON "Rockwell" Hardness Testers
In Business for Your Safety

S



Facts and Flashes

From the
ETHYL CORPORATION
Chrysler Building, N.Y.C.



*Progressive fleet operators
are still looking ahead*

You would not expect men who spend most of their waking hours struggling to keep a truck or bus fleet running under wartime conditions to pay much attention to the broad problems of the future. Yet progressive men in the field today show a definite interest in the possible post-war developments.

For example, more and more fleet men are beginning to realize the importance of the tremendous wartime development by the petroleum industry of high-octane aviation gasoline production. While this gasoline is used for military purposes, after the war much of the equipment used to produce it can readily be adapted for use in making higher quality civilian gasoline. So forward-looking fleet operators are asking, "How can we benefit from the higher octane gasoline that will undoubtedly be on the market shortly after the war?"

The answer is not a simple one. Operators must consider existing equipment as well as new vehicles. Because of the wide variation in types of equipment, this problem should be worked out in terms of the individual fleet. But, generally speaking, it seems that many engines can be adjusted to benefit from higher octane gasoline and that manufacturers may, in certain instances, recommend engine modifications at overhaul time.

Thus, the fleet operator will be able to work out a planned conversion to high-octane gasoline which will enable him to get maximum service from his existing equipment as he gradually acquires new units. In working out such a plan, the service departments of petroleum refiners and engine manufacturers will be glad to cooperate.

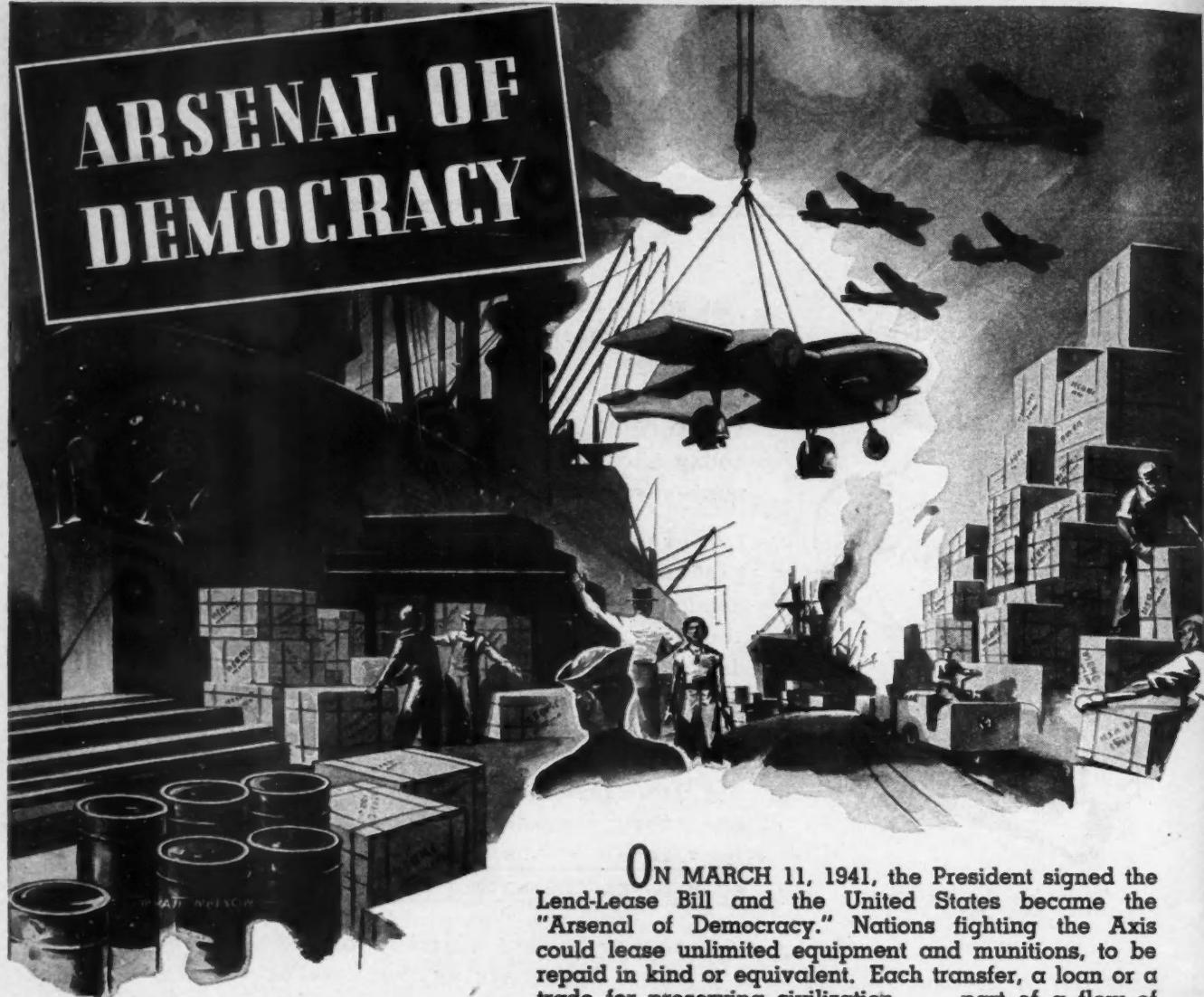
* * *

WARNINGS AGAINST PETROLEUM-BASE BRAKE FLUID
have been issued by the Automobile Manufacturers' Association. The government recently sold a large surplus of this fluid, which was designed for use only in military aircraft.

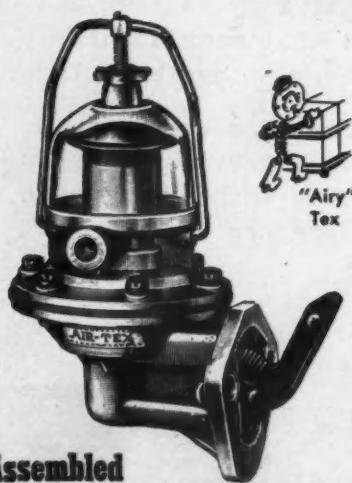
Some of this fluid may find its way into the hands of jobbers, dealers and service stations. While it is satisfactory in aircraft, should even a small amount of this petroleum oil be used in trucks, buses or automobiles, a swelling of the rubber cups in brake master cylinders and a deterioration of the flexible hose lines might result.



ARSENAL OF DEMOCRACY



ON MARCH 11, 1941, the President signed the Lend-Lease Bill and the United States became the "Arsenal of Democracy." Nations fighting the Axis could lease unlimited equipment and munitions, to be repaid in kind or equivalent. Each transfer, a loan or a trade for preserving civilization . . . part of a flow of arms that would, as the President said later, "accelerate from day to day, until the stream becomes a river, and the river a torrent, engulfing this totalitarian tyranny which seeks to dominate the world." Lend-Lease means countless "deals" that profit one and all.



Assembled
with AIRTEX Diaphragms
Guaranteed for 50,000 Miles



AIRTEX AUTOMOTIVE CORPORATION, FAIRFIELD, ILL.

You, too, will make a profitable DEAL on every oiling fuel pump you trade to your jobber for

Factory Tested
AIRTEX
Exchange FUEL PUMPS

"Your profits climb with the AIRTEX Line"



"GO" BEST DESIGN!

...For cost-conscious Truck Operators

● Night and day, on every highway in America, Kellys go—keeping up with stiff schedules. The new Kellys are living up to expectations. They're tough.

Completely redesigned to insure maximum performance from new materials, today's new Kelly is cooler-running. The tread is designed scientifically to resist tearing, cutting and chipping.

Continual developments in compounding and in engineering are producing constantly better performance from today's new materials. Expanded facilities and the latest im-

KELLY
Springfield
TIRES

proved machinery and equipment are your assurance that Kellys will continue in the future, as in the past, to render better than average service. To cost-conscious truck operators that is a good guide to follow when they're eligible for new tires.

Meanwhile, keep your present tires rolling by depending on your Kelly Dealer for expert tire-saving service . . . repairs . . . recaps.

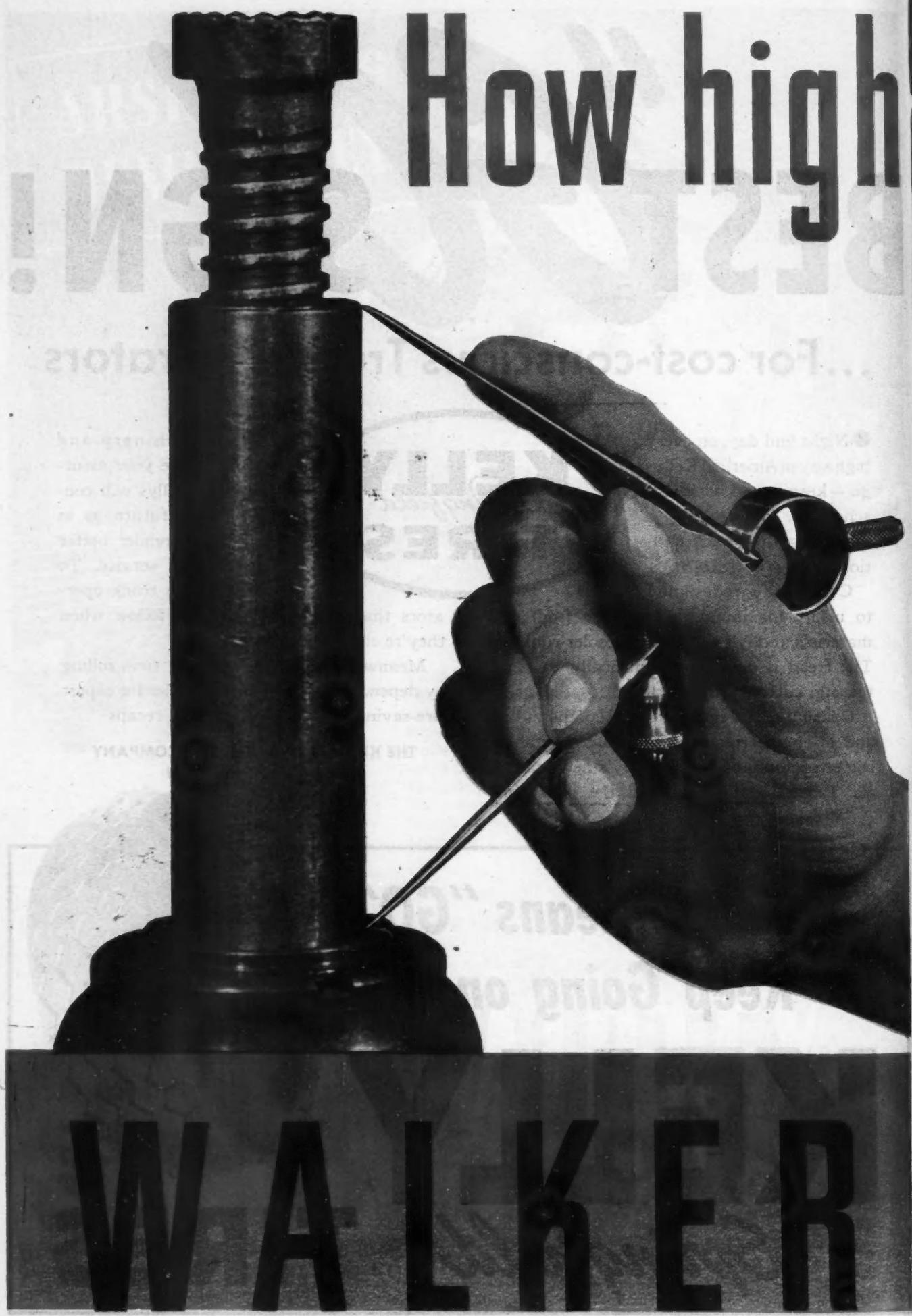
THE KELLY-SPRINGFIELD TIRE COMPANY
Cumberland, Maryland

Green  Means "GO"—
Keep Going on

KELLY
Springfield **TIRES**



How high



is too high?

**"TOO HIGH" JUST CAN'T HAPPEN
WHEN YOUR PORTABLE HYDRAULIC JACKS ARE
WALKER SERIES 900's**

...and the reason is

WALKER KNOW-HOW

• We could put a warning on our jacks, in big red letters: *DANGER! Don't Raise This Jack Too High!* But sometime, somewhere, someone wouldn't see it and go so high that the end of the ram left in the jack just couldn't hold. Or somebody might keep on pumping 'til the ram popped right out of the jack.

So, Walker takes no chances. *Too high* just can't

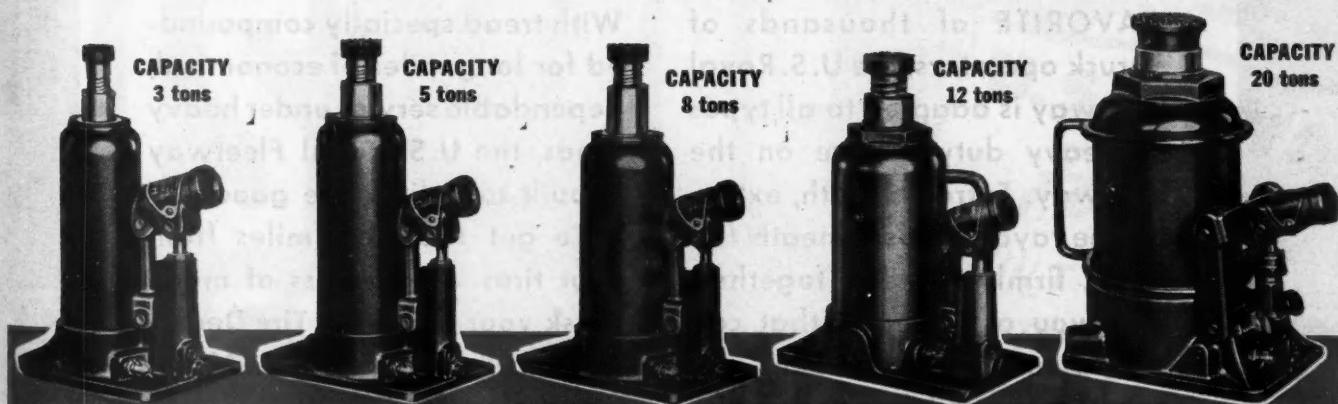
happen in a Series 900 portable hydraulic jack. Walker engineers make doubly sure—with two simple, independent, trouble-proof devices that never fail to stop the ram at the top permissible height.

Features like this . . . seemingly little, yet tremendously important . . . don't just happen in Walker jacks. They're the result of knowledge and experience—of Know-How—that comes from long years of constant, scientific effort to make better and better jacks.

And because of this Know-How, Walker leads in jacks.

WALKER MANUFACTURING COMPANY OF WISCONSIN • RACINE, WISCONSIN
Also Makers of Walker Exhaust Silencers and Electric Lifts

THE FAMOUS WALKER SERIES 900 PORTABLE HYDRAULIC JACKS FROM 3 TO 50 TONS CAPACITY



LEADS IN JACKS

U.S. ROYALS
FOR JOBS THAT TAKE
STAMINA

**FOR THE
HIGHWAY**



FAVORITE of thousands of truck operators, the U.S. Royal Fleetway is adapted to all types of heavy duty service on the highway. Extra strength, extra-gauge rayon cords beneath the tread, firmly bonded together, give you a tire body that can take plenty of punishment, yet can be recapped time and again.

With tread specially compounded for long miles of economical, dependable service under heavy loads, the U.S. Royal Fleetway is built to deliver the goods.

To get the most miles from your tires—regardless of make—ask your U.S. Truck Tire Dealer about U.S. Transportation Maintenance.

Listen to "Science Looks Forward"—new series of talks by the great scientists of America—on the Philharmonic-Symphony program. CBS Network, Sunday afternoon 3:00 to 4:30, E.W.T.



UNITED STATES
1230 SIXTH AVENUE • ROCKEFELLER

-IT'S THE FLEETWAY



FOR GREATER TRUCK TIRE MILEAGE

RUBBER COMPANY

CENTER • NEW YORK 20, N.Y.

FEBRUARY, 1945

Use postage-paid card inserted in this issue for free information on advertised products

WARTIME PARTS He's your watchdog on product

Because he has become the "watchdog" of quality in the parts, tools, equipment, accessories and supplies you buy, your Jobber has helped you maintain high standards of efficiency.

From you and the many other shops he serves, your Jobber gathers opinions and suggestions on the multitude of products he stocks for your service—opinions on how quality can be improved—ideas on new or improved parts, tools or accessories which encourage better, safer driving.

As each new product comes through, from the 963 manufacturers he has working for you, your Jobber must

satisfy himself as to its merits. Is it as good or better than the best on the market? Does it contribute to better performance? Does it make a practical installation?

If it meets his strict requirements, he brings it to you for judgment. The long, practical experience combined in your working "partnership" produces a quick and sensible answer.

That's why your teamwork has been so successful in the past. When wartime restrictions are lifted and the automotive Service industry can again reach its stride, this working partnership will carry both of you to greater success!

NATIONAL STANDARD PARTS ASSOCIATION

PARTS • TOOLS • EQUIPMENT • SUPPLIES • ACCESSORIES

35th Floor, Willoughby Tower Building • Chicago 3, Illinois

quality



*You can
depend upon your JOBBER!*

NSPA

THE COMPLETE ASSOCIATION

Devoted to maintaining and improving the Quality Standards of Service Parts, Equipment and Accessory manufacture, distribution and installation in America's 30 million automotive vehicles.





SERVICE PARTS FOR MARMON-HERRINGTON BUILT TRUCKS **Shipped by Truck, Train, Ship and Plane...**

In almost every country flying a flag of the United Nations, Marmon-Herrington *All-Wheel-Drive* vehicles—military and civilian—are helping win victories for Allied arms.

They must not lose an hour of service for want of replacement parts, if it is at all possible to get the parts to them.

To obtain essential materials, process and fabricate them into service parts, protect these parts from rust and corrosion, pack them safely

for shipment, and speed them on their way, has been a big task in these years of war shortages. But the job *has been, and is being done*.

Every effort has been made to supply essential parts to our customers. It is our obligation, as well as yours, to keep your present Marmon-Herrington trucks rolling until new and improved models are available. In so doing, we speed production of vital war materiel—and hasten the hour of final victory.

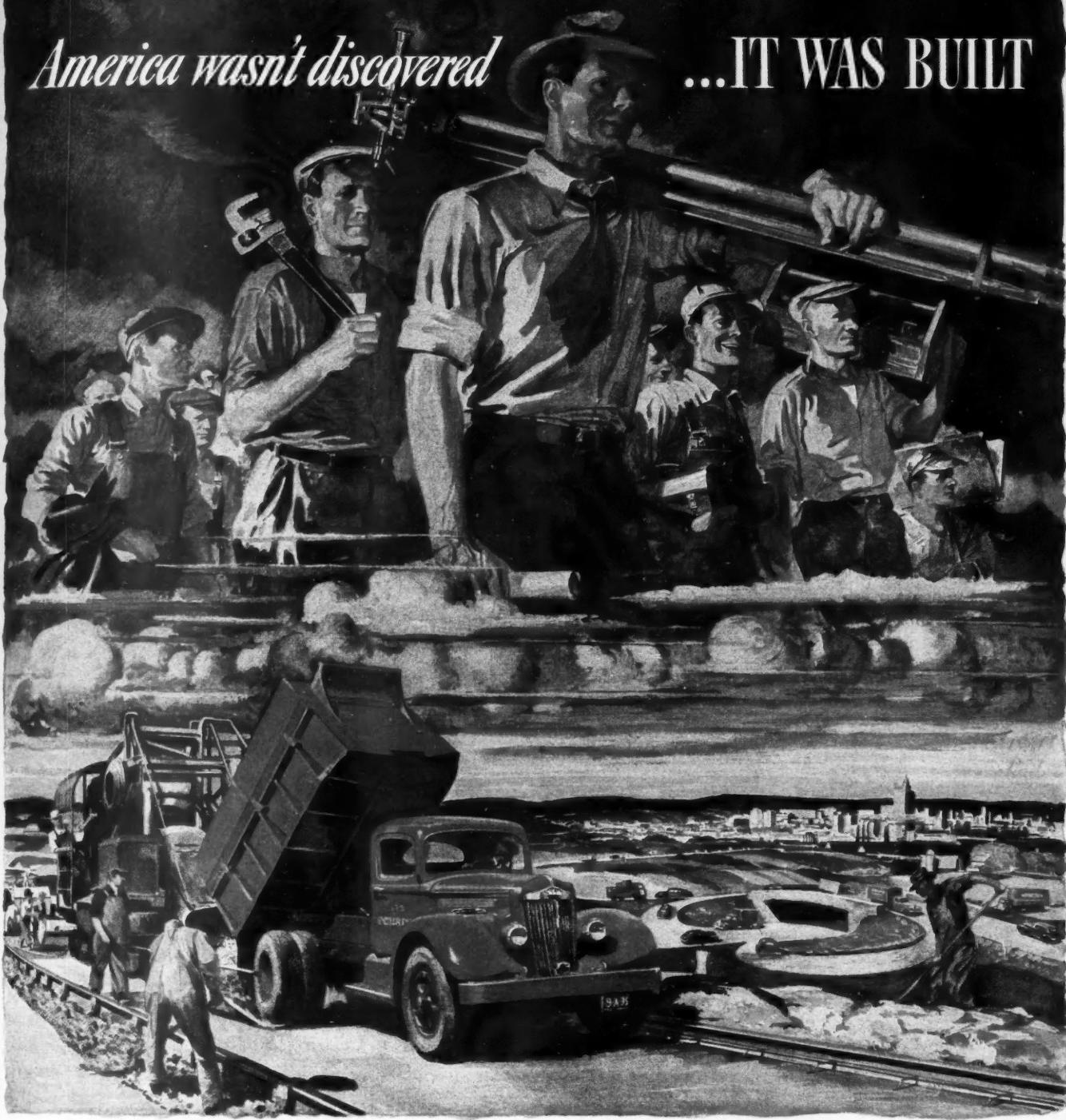
BUY MORE IN '45 • WAR SAVINGS BONDS

M A R M O N - H E R R I N G T O N
All-Wheel-Drive **T R U C K S**

MARMON-HERRINGTON CO., Inc., INDIANAPOLIS 7, INDIANA
Cable Address: MARTON

America wasn't discovered

...IT WAS BUILT



And the best is yet to come. The construction industry—in doing its tremendous wartime job—has developed new materials, designs and methods which will bring better housing for millions . . . safer highways and a hundred other good things when the manpower and materials again become available.

For years, White Trucks have been good tools in the kits of

the nation's builders. They have earned a reputation for "doing the hard jobs better." And when large-scale peacetime construction is resumed, White *Super Power* Trucks will provide the industry greater truck efficiency, longer life and more economy than it has ever experienced.

THE WHITE MOTOR CO. • Cleveland, Ohio, U.S.A.

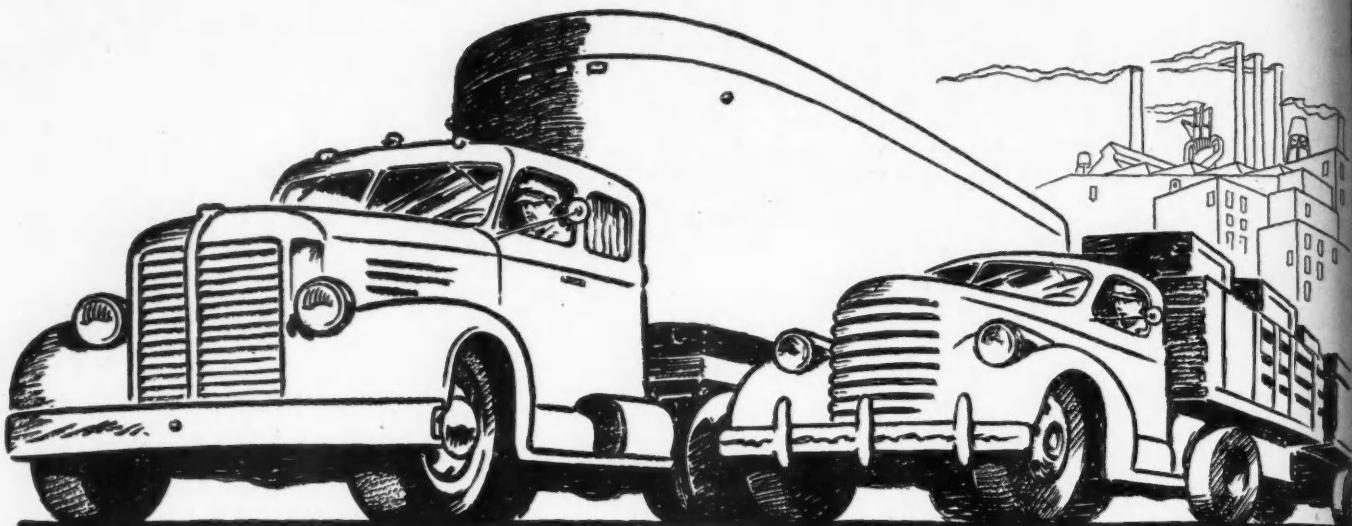
A larger volume of new Super Power Whites for commercial use is now assured for 1945 by government order. Your White representative will be glad to help you make application.



FOR MORE THAN 40 YEARS

THE GREATEST NAME IN TRUCKS

★ TRUCKS CARRY A WAR LOAD ★

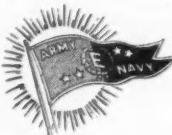


Exide-equipped trucks roll along wheel to wheel with production



KEEPING pace with today's immense production—getting goods and material out and on their way to the battle fronts—is an achievement of which truck owners may well feel proud. To do this under present handicaps is little less than a miracle. Maintenance men are doing a big job in a big way. It is gratifying to know that the extra quality built into Exide

Batteries is helping to lighten their load. Better than anyone else, the maintenance man understands the importance of quality in truck construction and truck equipment. He knows that only the best will stand up under the heavy transportation strain of today. And he is frank in stating that he can always count on Exides for dependability, long-life and ease of maintenance.



THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto



GLENDENNING

ILLINOIS • IOWA • WISCONSIN • MINNESOTA • NO. AND SO. DAKOTA

DAILY REFRIGERATED SERVICE

"Fine performance for us since 1927" ... that's DIAMOND T *reliability!*

"**M**Y experience with Diamond T equipment began in 1927", writes W. Gordon Glendenning, president of Glendenning Motorways, Inc., of St. Paul. "Since that time I have been continually adding Diamond T trucks to my fleet, operating them under maximum loads in both long distance and local work."

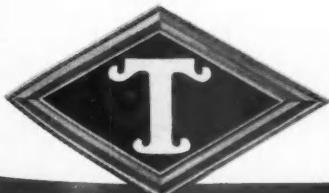
In the 18 years since 1927, Mr. Glendenning has had opportunity to become well acquainted with Diamond T reliability. His trucks operate between Chicago, Milwaukee, Twin Cities, Duluth, Fargo, Sioux Falls and Huron—in country where temperatures vary from a hundred above to fifty below zero. There is no tougher trucking weather. "My compli-

ments on fine performance," is Mr. Glendenning's measured verdict.

From coast to coast, from Canada to the Gulf, thousands of leading operators share this opinion. They prefer Diamond T for dependable, economical, heavy-duty performance in all types of service. The Diamond T reputation for extra stamina has been in the making since 1905. It will be further advanced by the finer Diamond T's now being engineered for post-victory delivery.

Diamond T has been authorized to build a limited number of commercial trucks at this time. See your Diamond T dealer if your service qualifies for Rationing Board approval.

DIAMOND T MOTOR CAR CO. CHICAGO
Established 1905



DIAMOND T TRUCKS

Here's Where the Trouble Starts!



*And here's where
Trouble Starts on
an Oil Pumper*



You know you're headed for trouble if you undertake to recondition an oil pumper without first knowing what causes the motor-fouling oil waste! Check the engine bearings! Worn bearings let too much oil reach cylinder assemblies. Forced into combustion chambers, it burns to carbon on pistons, rings, spark plugs and valves. The best of new rings can't stop oil pumping caused

by badly worn bearings. To restore full power, pep and economy, replace worn bearings with Federal-Mogul Oil-Control Bearings. (Service bearings are a critical war material. Use them only where essential. We are doing all we can to keep your Jobber supplied!)

FEDERAL-MOGUL SERVICE • DETROIT 1, MICH.
DIVISION OF FEDERAL-MOGUL CORPORATION

Replace With Genuine

FEDERAL-MOGUL

Oil-Control Bearings



For the Final Push... BUY WAR BONDS NOW!

The INSIDE STORY about **Firestone** TRANSPORT TRUCK TIRES

**TWO EXTRA PLIES
UNDER THE TREAD**

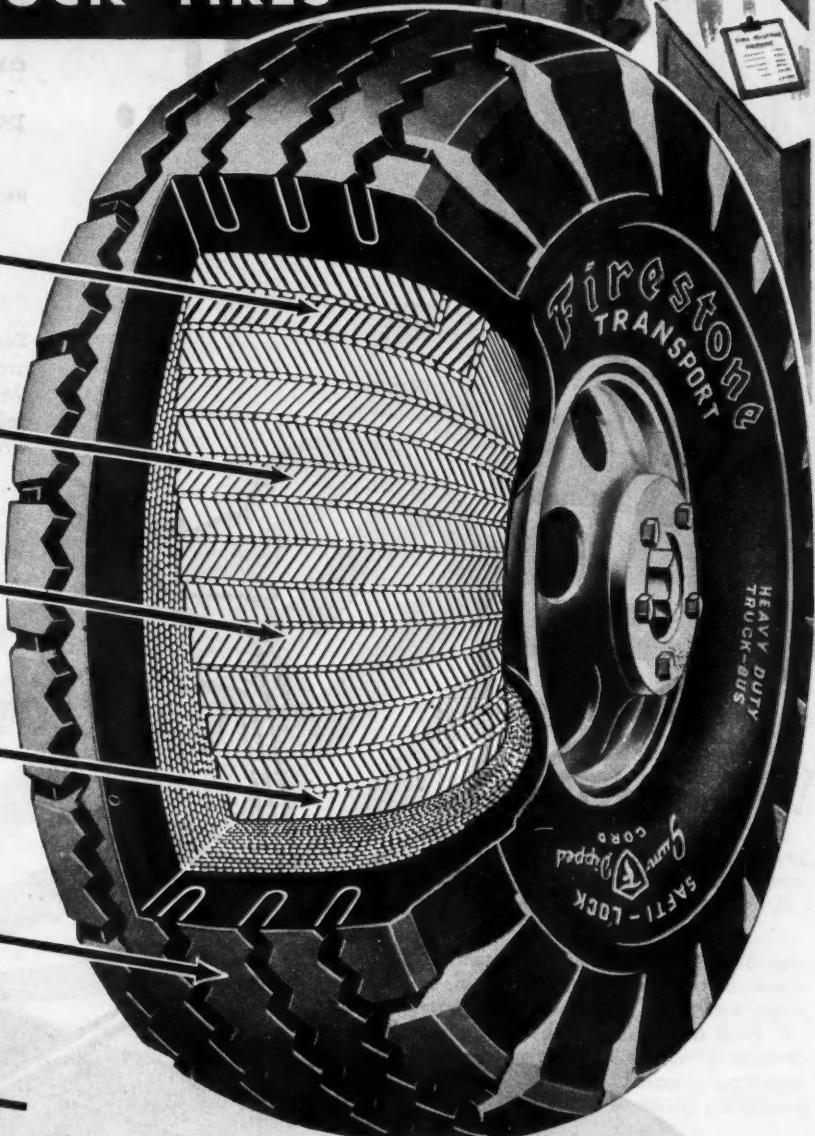
GUM-DIPPING

**Duraflex
CONSTRUCTION**

RAYON CORD

**LONG-WEARING
TREAD**

TWIN BEADS



Tire mileage records tell the *real* inside story about Firestone Transports and why their *cost per mile* is lowest.

The reasons for this are many. Firestone "know-how" makes more effective use of allowable crude rubber for strengthening the bond between the cord body and the tread. The use of extra strong, cool-running rayon cord increases durability.

Then, too, Firestone's time-tested extra values . . . Gum-Dipping, Duraflex body construction, two extra plies under the tread, and twin beads . . . are more effective than ever in lengthening the life of today's Firestone Transport tires.

That is why they can give you the lowest tire cost. Best today, Firestone Transport tires will be even better tomorrow.

Copyright, 1945, The Firestone Tire & Rubber Co.

FIRESTONE TRANSPORT TRUCK TIRES

Soft pressure does it..

It doesn't take much pressure to make a piston ring work—just enough to keep it on the cylinder wall. That's why soft pressure Hastings Steel-Vents stop oil pumping in badly tapered cylinders—and win equal praises for long life and performance in rebored jobs.

HASTINGS MANUFACTURING COMPANY • HASTINGS, MICHIGAN
Hastings Mfg. of Canada, Ltd., Toronto

SOFT PRESSURE DOES IT—IN REBORES, TOO
Engines, in grocery trucks, lead a hard life. Here's one grocer's experience: "We have been using Hastings Steel-Vent sets in our trucks for seven years — both in re-ring and rebores. They have given us longer life, less cylinder wall wear and more efficient motor service."

★ IT'S A PRIVILEGE
TO BUY WAR BONDS

HASTINGS STEEL-VENT

PISTON RINGS

U. S. PAT. 2,146,997

TOUGH ON OIL-PUMPING GENTLE ON CYLINDER WALLS





FEDERALS HAVE WON . . . *By Costing Less to Run!*



CONSERVE YOUR TRUCKS

While Federal is now producing certain models for essential civilian needs—your patriotic duty still demands periodic truck check-ups to "Keep 'em Rolling for Victory."

Many large fleet operators have learned to place so much reliance in Federal trucks that they are now standardizing on these dependable units.

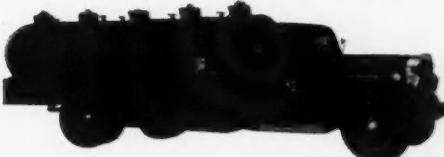
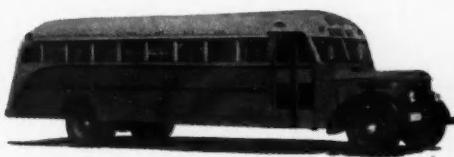
One very important reason for this is unquestionably the fact that Federals have never been "round peg trucks in square hole jobs." The wide range of models, power ratings and varying tonnage capacities offered by Federal have enabled the buyer to fit the right truck to his specific needs with cost-saving results.

Hence, Federal's reputation for building trucks that last for years, pay out better and, in the words of owners: "Cost less to run."

★ ★ ★ ★

As further evidence of this ability to produce highly efficient, dependable motor transport units, the Army and Navy again have recognized Federal with a third "E" citation for meritorious service in meeting the needs of our Armed Forces . . . a tribute to Federal's truck manufacturing proficiency and long experience.

FEDERAL MOTOR TRUCK COMPANY, DETROIT 9, MICHIGAN

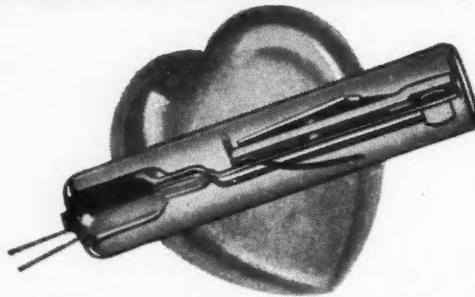


FEDERAL TRUCKS

Since 1910... Known in Every Country—Sold on Every Continent

You're Looking at a

GLASS HEART!



It's an Exclusive Feature that
Puts the "Push" in

STEWART-WARNER ELECTRIC FUEL PUMPS

Only 2 1/4" long, this little glass tube holds the contact points sealed in hydrogen. This assures constant positive pump action. The hydrogen in the tube keeps the points cleaned automatically, and greatly reduces burning, sticking, and pitting. Operated and controlled magnetically. Approved by the famous Underwriter's Laboratories.



Here's the Traffic-Tested STEWART-WARNER ELECTRIC FUEL PUMP that Ends Vapor-Lock and Fuel Pump Failure!

TODAY'S schedules don't allow for delays caused by vapor-lock and fuel pump failure. This is no time to risk ruining irreplaceable equipment because of fuel pump fire. Never has every truck been more vital in the battle of transportation.

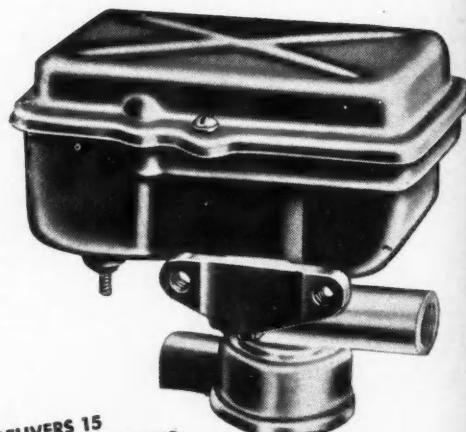
That's why Stewart-Warner Electric Fuel Pumps are going on more and more trucks, either as replacements or as auxiliary "safety" pumps for heavy-duty operation.

The pump is easily mounted at the tank. It pushes fuel to the carburetor under pressure, eliminating air bubbles and vapor-lock. No rotating

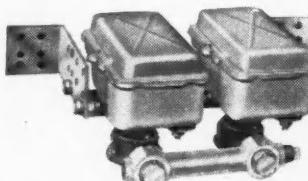
parts, no piston, no bearings to fail. Lasts longer because it doesn't "beat itself to death." Delivers 15 gallons an hour on an average current of approximately one ampere. Requires no attention.

Another feature is the well-tested special diaphragm of DuPont Fairprene that absolutely won't fail! The contact points sealed in hydrogen-filled tube insure long contact point life.

Write today for complete information. Stewart-Warner Corporation, 1876 Diversey Parkway, Chicago 14, Illinois.



DELIVERS 15
GALLONS PER HOUR
AVAILABLE NOW!



• Use Stewart-Warner Dual Electric Fuel Pumps where gas consumption is high—gas mileage lower than average. Dual pumps more than double the life of each pump. Can be installed so that each pump operates independently.



STEWART-WARNER
ELECTRIC FUEL PUMP
STEWART-WARNER CORPORATION



Each tire and wheel turns independently...and has its individual brake...

Makes a trailer much easier to maneuver...Saves fuel...and tires...

Every part easy to get at...A simple, rugged, safe axle.

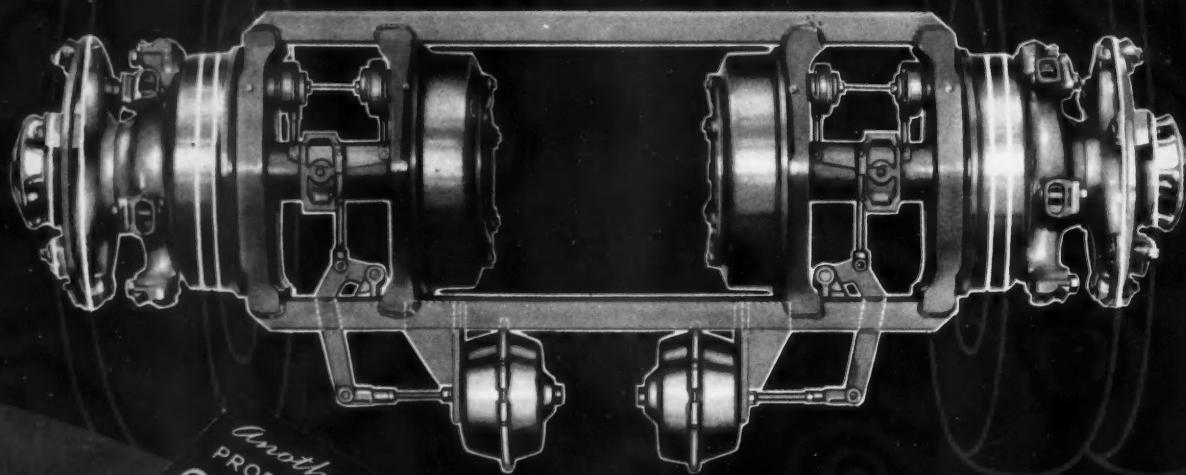
When you examine the phantom view of this extraordinary axle, you note several interesting facts:

- EACH WHEEL ROTATES FREELY, ENTIRELY INDEPENDENT OF THE OTHER
- THE OUTER WHEEL—OF DUAL WHEELS—is SERVED BY THE INNER BRAKE
- EVERY VITAL PART IS EASY TO GET AT AND EASY TO SERVICE

How this unique design achieves sizable operating savings is easy to understand. Tires last longer because free wheel rotation eliminates wheel slippage which is prevalent when dual tires are conventionally mounted ... (Continued on following page)



SEE OTHER SIDE FOR MORE DATA →



*Another
PRODUCT OF*
CLARK
EQUIPMENT
COMPANY



BLIND RIVETING PROCESS



AXLE HOUSINGS



DRILLS AND REAMERS



GEARS AND FORGINGS



ELECTRIC STEEL CASTINGS



TRANSMISSIONS



METAL SPOKE WHEELS

as much as 19 inches on an ordinary turn, and up to 150 feet per mile due to curves and road irregularities.

Better braking, too, is an obvious saver of tires—an individual brake for each wheel; four 16-inch drums with more than 400 square inches of braking surface.

Why drivers prefer this type of axle is also easy to understand. It provides much-easier handling, much greater maneuverability. For inspection and service, as well, the design offers many advantages—the ample ventilation of spoke wheels, tires and brake parts, to keep temperatures low; and the well planned accessibility of every vital part.

Here, indeed, is an axle distinguished for practical operating efficiency, for sensible simplicity and for rugged construction.

To find out how this axle will cut your operating costs—consult Clark transport engineers. Simply write or letter.

CLARK EQUIPMENT COMPANY • Buchanan, Michigan

Also—BATTLE CREEK—JACKSON—BERRIEN SPRINGS, MICHIGAN

CLARK

Easy Roll

TRAILER AXLE



RAILWAY CAR TRUCKS



FRONT AND REAR AXLES
FOR TRUCKS AND BUSES



INDUSTRIAL TRUCKS
AND TRACTORS



BOOSTER UNITS



Bombers Roll and Fly

ON BOWER ROLLER BEARINGS—On the runway or in the air, Bower Roller Bearings carry the rolling load of the big Bombers—in the engine, in the controls, in the landing wheels and other locations. World War II is a war on bearings.

BOWER
ROLLER BEARING CO.
Detroit 14, Michigan

DeVilbiss BODYGUARD Service



A powerful protection for your fleet!

Right now, your trucks are entering the toughest stretch of their service—the period between now and replacement. And they need stronger protection than ever during that time. So, give 'em DeVilbiss BodyGuard Service.

It protects the Upper-Body against rust attacks that mean extra shop time for repairs—and against shabby appearance that can ruin a good name.

This new DeVilbiss BodyGuard Service gives Under-Body protection, too. It stops destructive corrosion and abrasive wear of underbody parts due to road salts, exhaust fumes, slush, cinders and gravel.

For extra miles and dependable performance, put this DeVilbiss BodyGuard protection around your fleet now. Ask your DeVilbiss distributor what you need to put up this guard.



THE DEVILBISS COMPANY • TOLEDO 1, OHIO
Canadian Plant: WINDSOR, ONTARIO

UPPER-BODY PROTECTION



means:

Good Looks—Good Advertising • Good Impressions of Your Service • Less Fender and Body Repair

UNDER-BODY PROTECTION



means:

Fewer Underbody Repairs and Parts Replacements • Longer Truck Service • Load Protection in Transit



DE VILBISS

Spray Systems

SPRAY EQUIPMENT • EXHAUST SYSTEMS • AIR COMPRESSORS • HOSE & CONNECTIONS



Thermoid HELPS BREYERS SERVE MORE HELPINGS

Ice Cream is one of the most highly perishable commodities. Delivery cannot be left to a hit-or-miss schedule. Breyer Ice Cream Company, of Philadelphia, supplying ice cream to millions of customers in the three-state area of New York, Pennsylvania and New Jersey, thoroughly realizes the value of absolutely dependable equipment. That is why they use Thermoid Products on their fleet.

Speaking of Thermoid Products, Breyer Ice Cream Company says, "Our experience

with Thermoid Products dates back to 1920. We are now using Thermoid Brake Linings, Fan Belts, Clutch Facings and Radiator Hose on our fleet because we find these products absolutely dependable in performance and an important factor in keeping our deliveries on schedule with lower maintenance costs."

You'll find that Thermoid Products will help your fleet keep its maintenance costs down and its performance up. Specify Thermoid and you'll see the difference.

Thermoid

Custom-Built Brake Lining Sets • CBB Sets • Thermo-blocks for heaviest duty



JOIN NOW!

* THERMOID COMPANY * Trenton, New Jersey *

For Your Trucks or Buses — — Don't Just Order a "FAN BELT"

Special Heavy-Duty Compound

30% Stronger Cords

Than Used in
Passenger Car Belts

**Multiple-Ply
Cover . . .**

Much Longer Wearing
Than on
Passenger Car Belts

LOS ANGELES, Cal.

"In our heavy hauling from Arizona across desert and semi-desert regions with the thermometer frequently well over 100 degrees, we can run your Gates TRUCK Belt long after it would have been necessary to replace any other belt we have used."

—Consolidated Cigar
per State Lines.
R. C. Hutchinson, Mfg. Sales
Shop Supl.

CHICAGO, Ill.

"On our more than 200 units in cross country service your special TRUCK belt operates our conditioning equipment in addition to the extra heavy belt load due to rear engine drives. We are getting 80% longer wear than any other belt has ever given in this unusually tough service."

—All American Bus Lines.
H. Weinstein,
Gen'l Pur. Agt.

"80%
LONGER
LIFE"

**Sold for
TRUCK and BUS USE Only!**

The Gates TRUCK Belt is sold for use on trucks and buses ONLY. This is because some of the materials used are allocated for this particular purpose. Truck and bus transportation is important in the war effort. Gates TRUCK Belts must be used on trucks and buses only. Each belt container bears this statement.

WELLSBORO, Pa.

"Since using your special TRUCK belts we haven't had a single road failure. They often last twice as long as other belts. We can count with safety on at least 50% longer life."

—H. W. Taynton Trucking.
Robert Taynton.

"WEARS
TWICE AS
LONG"

SHREVEPORT, La.

Your specially engineered TRUCK belt has eliminated fan belt worry. It outlasts any truck belt we ever used before by one-third or more."

—Louisiana & North West Transfer
Co., A. H. Semple.

"OUTLASTS
ANY OTHER
BELT"

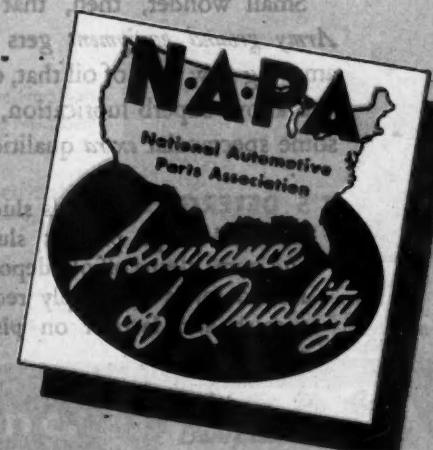
Your NAPA Jobber is a Good Man to Know!



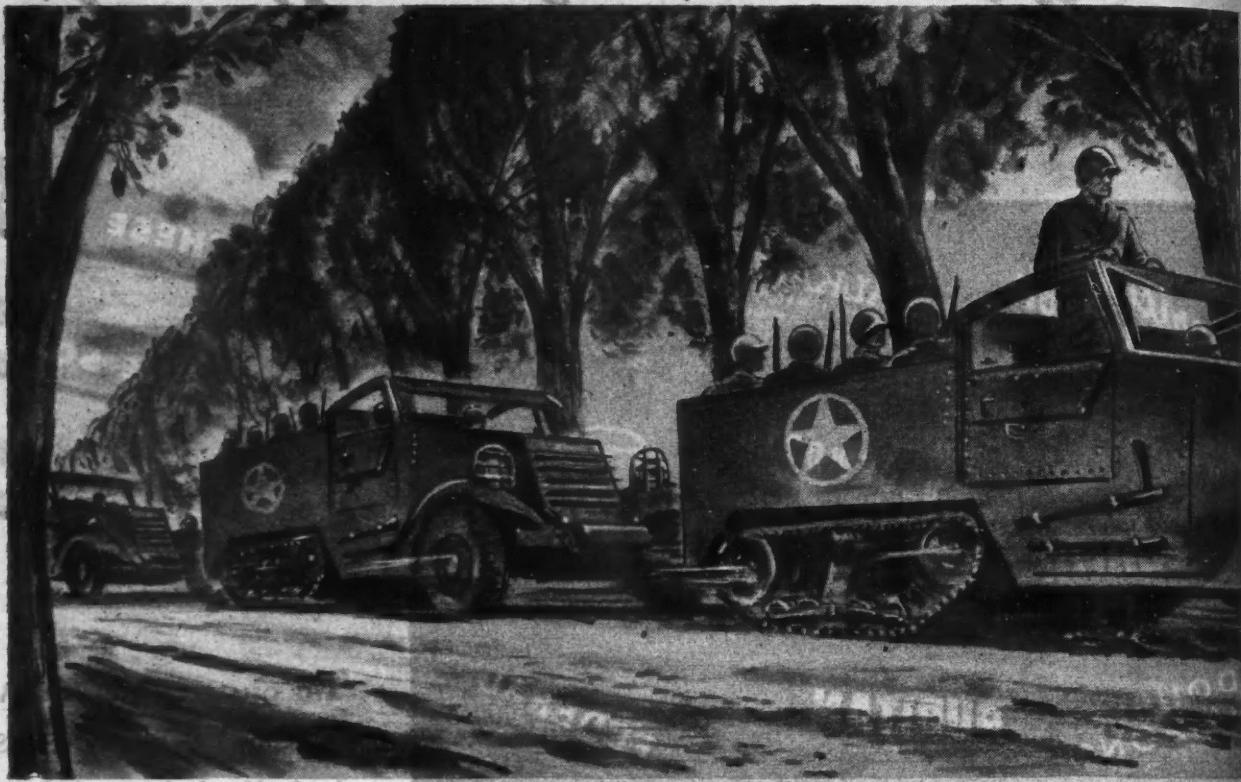
AND THESE QUALITY
LINES ARE SOME OF
THE REASONS WHY

THE QUALITY of all NAPA lines
is assured by the NAPA Seal—
backed by the largest independent
organization in the parts industry.

Wherever you may be, a nation-
wide network of more than 1800
jobbers, and 38 strategically lo-
cated warehouses, assures you of
prompt, complete and convenient
service on all these lines, for all
cars and trucks.



NATIONAL AUTOMOTIVE PARTS ASSOCIATION
DETROIT, MICHIGAN



With the Army, it's lives-

**that this new type of
VEEDOL 90 H.D.**

IT'S DISPERSIVE — washes out carbon. This oil keeps the carbon particles separate. They can't "gang up" in trouble-making formations. It washes off old carbon deposits—and all this matter is actually drained off with every oil change.

IT'S ANTI-CORROSIVE — saves bearings. It protects the new type copper-lead bearings from attacks of corrosive compounds that result from oxidation.

Not your life, perhaps, but your livelihood depends on your rolling equipment. Are you overlooking a

vital bet in Veedol 90 H.D. — the same identical type of oil the Army uses?

Veedol 90 H.D. is fully detergent, dispersive, and anti-corrosive. It can give your equipment better miles, more miles, profitable miles. It can help keep your trucks out of the repair shop. It can greatly increase service between overhauls.

Veedol 90 H.D. comes in S.A.E. 10 to 50. Write today for full information and prices.

TIDE WATER ASSOCIATED OIL COMPANY
NEW YORK 4, 17 Battery Place
TULSA 2, Thompson Bldg.

REAR AXLE STUD

(U. S. Pat. No. 2,320,420)

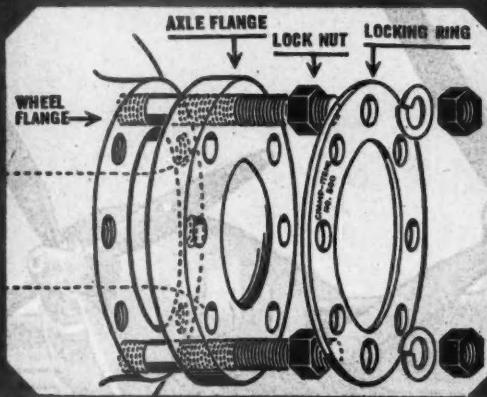


LOCKING RINGS

for TRUCKS

STUD LOCKING RINGS

Lock all studs together as one unit;
provide the extra bearing, stop rock
at tip and your stud troubles are over.



- 1 The rear wheel stud nuts do not come loose as is commonly thought, it is the studs that come loose out of the wheel hub.
- 2 The Locking Ring having nuts on both sides tie this into one unit making it impossible for studs to rotate or back out.
- 3 This Lock Ring supports each stud and distributes the pull so that all the studs carry the same load.
- 4 After this installation, you could not loosen or remove any one of these studs unless you removed all the outer nuts and Locking Rings.



Remove standard nuts and studs. Install longer studs furnished with kit; replace axle, using old nuts.

These patented rings — made of steel — come in kits complete with all parts necessary for one truck. These sets fit the following trucks:

No. 500 Chevrolet 1939-41 All 2-speed Timken Axles (Early '41 Taper Holes). 1937-41 All Eaton 2-speed. 1937-39 S, T, V Series. 1936 R Series.

No. 500A Late Model Chevrolet W. Y. M. Series 2-speed.

No. 501 Ford 1½ Ton '39-'42, Transit Type Bus. Ford '34-'42, 1½ Ton Trucks. GMC 1½ Ton '35-'42. Federal 1½ to 4 Ton Timken Axle. Reo 1½ to 2 Ton '41-'42 Models 19 and 20. Autocar B. M. Timken '38-'44. White '35-'41 86, 86 Spec., 87, 510, 700-A-D-P-R, 704, 704 Spec., 804, 875 Spec., WA14, (Timken).

No. 502 International D-300, C-30, D-30, K-5.

No. 502A International DS-30, DS-300, DS-186T, DS-35, CS-20, CS-30, CS-35, CS-35T, CS-35B, D-35, C-35, C-35T, C-35B, D-35B, C-40F, D-216F, CS-40, DS-400, DS-40, CS-40T, DS-216T, DS-400, D-216T, D-400, B-4, D-40, C-40, C-40T.

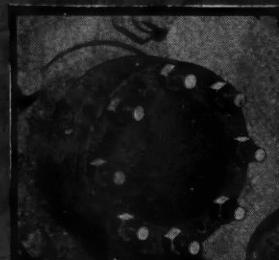
No. 502B International K-7 Late Models.

No. 503D Dodge Trucks (See Complete Listing No. 500 Series Specification Sheet). Stud Size—Standard $\frac{7}{16}$ " x $2\frac{3}{4}$ ". Flange Size O. D. $5\frac{1}{4}$ "—Number of holes 8. Bolt circle dia. $4\frac{1}{2}$ ".

No. 504D Dodge Trucks (See Complete Listing No. 500 Series Specification Sheet). Stud Size—Standard $\frac{7}{16}$ " x $2\frac{3}{4}$ ". Flange Size O. D. $5\frac{13}{16}$ "—Number of holes 8. Bolt circle dia. $5\frac{1}{32}$ ".

List \$7.00 per Set

Packed individual sets of: 2 Lock Rings — all necessary special studs—lockwasher and nuts.



Remove axle shaft "pull-out" studs.



Place lock ring against hexagon nuts and use lock washers and hexagon nuts furnished with kit. Draw up tight.

CHAMP-ITEMS, Inc.

6191 MAPLE AVE., ST. LOUIS, MO.

Write Us For
Complete No. 500
Specification Sheet



BRAKE LININGS, CLUTCH FACINGS, FAN BELTS, HOSE — FOR TRUCKS.



From where they *Grow* to where they *Go!*

TRUCK OPERATORS AND FLEET OWNERS

Write for your copies of illustrated color booklets which give full details of the economy and many improvements built into the new Highway "Freightmasters" and "Clippers."



ON EVERY U. S.
HIGHWAY

Grain and livestock from the fertile farmlands of America's windswept plains, destined for the nation's market places. How best to get them there? By HIGHWAY Trailer, of course! For on thousands of roads all over America, Highway Trailers have demonstrated their utter dependability in carrying greater pay loads at lower cost.

Now, with a partial return to the manufacture of commercial trailers, Highway engineers are utilizing the experience acquired from the punishing tests of three years of wartime transportation.

See the new Highway trailers now coming off the production lines. They are sturdier than ever before, yet lighter in weight, easier to maintain, and capable of carrying even heavier loads to the nation's market places.

HIGHWAY TRAILER COMPANY



Factory and General Offices, Edgerton, Wisconsin

Truck Trailers and Bodies • Earth Boring Machines
Winches and other Public Utility Equipment

HIGHWAY AMERICA'S QUALITY TRAILERS



*I said "GIMME NEW PISTONS
FOR THE OLD BUS" and Lookit!*

"Replacements for the old car at home were what I was thinking of—LYNITE* LO-EX PISTONS. But with everybody working to win the war, it's only natural that they thought of my seagoing buggy first."

Yes, the push is still on war work. OHIO's busy at the old trade, making pis-

tons, but they're mostly booked for fighting equipment.

Just as fast as wartime demands permit, however, we promise to provide for those cars at home. Hard-working engines will then be outfitted with brand-new LYNITE LO-EX PISTONS, machined and sold by OHIO.



*Lynite and LO-EX are registered trade-marks of Aluminum Company of America, makers of castings for genuine Lynite Pistons.

THE OHIO PISTON CO.
CLEVELAND, OHIO



*Trade-mark "TIMKEN" Reg. U. S. Pat. Off.

TIMKEN
Tapered Roller Bearings

TIMKEN
Alloy Steels

TIMKEN
Seamless Steel Tubing

TIMKEN
Railway Roller Bearings

TIMKEN
Rock Bits



FIVE STAR FINAL IN HEAVY DUTY OILS

Ever since the early days of the gasoline engine, Wolf's Head Oil has been steadily improved to meet changing motor designs, increasing speeds and compressions. Latest product of this sixty years of experience is Wolf's Head Heavy Duty Oil, especially developed to stand up under severe wartime driving conditions.

Wolf's Head Heavy Duty, refined from 100% Pennsylvania crude, has five outstanding characteristics: ample detergency . . . resistance to oxidation . . . strong, tough film . . . non-corrosive to metals . . . resistance to high engine temperatures.

Every good lubricating oil boasts one or more of these important features. But only one oil—Wolf's Head Heavy Duty—combines and balances them to the same degree.

That's why this newest and finest of Wolf's Head Oils does an outstanding job of reducing engine wear and saving operating costs. That's why leading fleet owners use it everywhere. For proof that Wolf's Head Heavy Duty is safer, more practical and economical for your hauling job, send for a free copy of "Heavy Duty Maintenance." Address Wolf's Head Oil Refining Co., Inc., Oil City, Pa., or New York 10, N. Y.

WOLF'S HEAD LABORATORY CONTROL SERVICE

Gives fleet operators specific recommendations for their units, based on analysis of crankcase oil. Helps to establish correct drain periods, conserve engine life, reduce lay-ups and frequently reveals unsuspected engine trouble. Free and without obligation.

WOLF'S HEAD

MOTOR OIL AND LUBES

100% Pennsylvania



P.G.C.O.A. Permit No. 6



Any way you look at it...

A BLACKHAWK JACK IS YOUR BEST BET!

NO doubt about it! From sleek, efficient design to in-built guts, Blackhawk Hydraulic Jacks have that superior quality that distinguishes a leader. Brute power, precise control, dependability under all conditions — these are Blackhawk service-proved characteristics that make them the predominant choice of fleet and bus operators, and the automotive, aviation and industrial fields. That's why year after year, Blackhawk Hydraulic Jacks are found in the big majority of the shops that receive the annual Bus Maintenance Awards. Whenever uncompromising performance is demanded, you'll find Blackhawks. That's why Blackhawk Hydraulic Jacks are YOUR best bet!

A Product of **BLACKHAWK MFG. CO.**, Dept. J1125, Milwaukee 1, Wis.

This seal is found ONLY
on BLACKHAWK
HYDRAULIC JACKS—
Your assurance of a wise
and safe investment.



BLACKHAWK

Preventive maintenance begins on a GLOBE HOIST



Today—more so than ever before—your fleet of vehicles must be kept fit.

More revenue miles—more service is expected, regardless of age of vehicle.

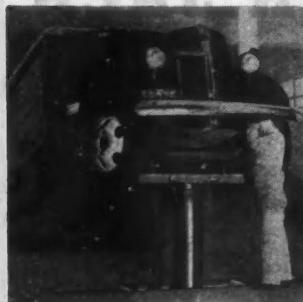
More frequent inspection—unit overhaul is required to preserve your critical wearing parts.

The biggest percentage of such work calls for access to the underside of the vehicle.

Manpower is scarce—so employ the GLOBE Universal Truck Hoist to save time—and enjoy accessibility quickly and with safety.

GLOBE HOIST COMPANY

Des Moines 6, Iowa
Philadelphia 18, Penna.



Used as a Front End Lift



Single post used for short-wheelbase Trucks or Automobiles

Globe Universal Truck Hoists—Wheel Dolly and Portable Pit Lifts—are available on W.P.B. limitation order L-270 to essential fleet operators.



DU PONT RECOMMENDS 259-LINE DU CO

REG. U. S. PAT. OFF.

for trucks and buses TODAY

YOUR OLD FAVORITE, DULUX, will be back as soon as possible. At present phthalic anhydride, an essential DULUX ingredient, is needed as a constituent of smokeless powder and for use in the manufacture of an insect repellent to protect our fighting men against disease. As a result, government order limits paint manufacturers to only a small quantity of phthalic anhydride, for the preparation of finishes for a few rigidly specified uses.

Until DULUX is again available, we recommend that you use 259-Line DU CO as the finish to protect irreplaceable automotive equipment. This fast-drying lacquer is easy to apply, dries to a high initial gloss, and requires no rubbing. 259-Line DU CO may be new to you, but it is not a wartime development. For years it has been the choice of American railroads for painting coaches, and its wearing qualities have been proved under severest climatic conditions. Use 259-Line DU CO now—plan on post-war DULUX tomorrow.

E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Refinish Sales, Wilmington 98, Delaware.

BUY BONDS—BUY MORE THAN BEFORE!

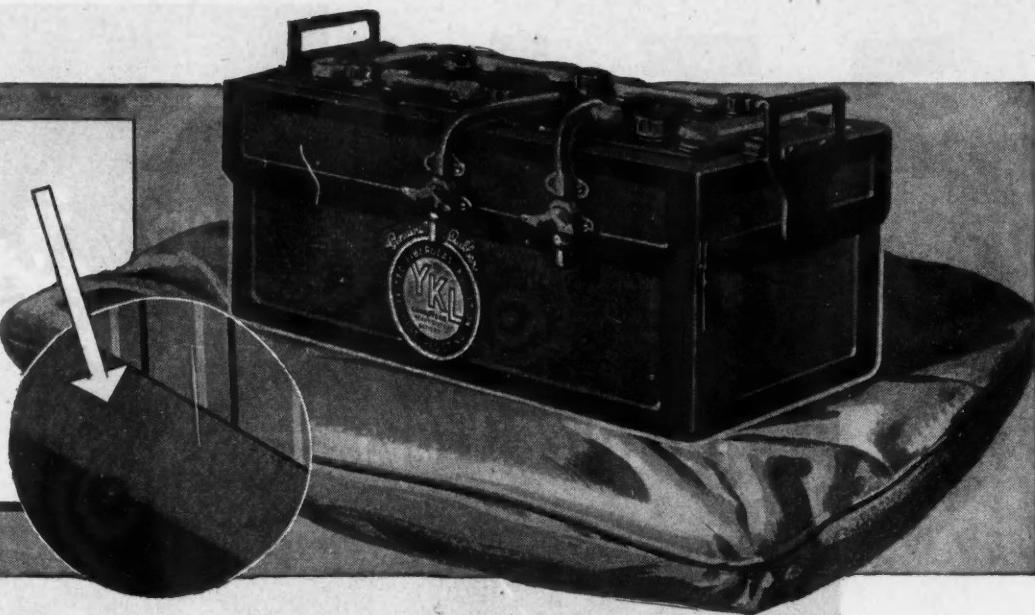
DU PONT REFINISHING MATERIALS

Better Things for Better Living
... through Chemistry



**THIS
SHOCKPROOF
CUSHION**

— of Felted Fiberglas insulation protects plates from brutal road shocks, lengthens battery life, ups starting power.



**More Punch, Surer Starts with
*CUSHIONED
POWER***

YOU'LL be needing plenty of punch-and-power starts to speed this year's overburdened transport schedules. And your best sure starter is Goodyear's great YKL truck battery — the really tough, heavy-duty giant that develops more starting and staying power because it's shock- and shake-proof.

What gives the YKL its extra-capacity performance is Goodyear's *cushioned power* construction. Felted Fiberglas mats placed between the plates protect and preserve them by cushioning them against bruising road shocks. That's plate protection at its greatest — and plate protection is the most essential requisite for longer battery life.

These mats also hold in the active element, reducing plate shedding and sediment to a minimum. And the resilient construction they provide combines acid- and heat-resistance with an extremely high porosity that permits acid to circulate freely to all parts of the

positive plates. Internal resistance is eliminated and capacity increased.

Get ready to handle the toughest transport jobs yet with this tougher, power-packed battery that gives you utmost plate protection, plus greater capacity and Goodyear quality. See your Goodyear dealer now for these super starters — top value for your battery dollar.

YKL—T.M. The Goodyear Tire & Rubber Company

**YOU GET THEM AT POWER-PEAK,
FACTORY FRESHNESS**



Your Goodyear dealer gets fresh, full-powered batteries from the factory — and keeps them that way continuously by trickle-charging until installed. That means more sure starts to start with and to keep going longer!

GOOD  YEAR
THE GREATEST NAME IN RUBBER

**YKL
BATTERIES**
—for buses, trucks, tractors

"Neglected carburetors can siphon off profits in Three Ways!"



1. GAS WASTE—Leakage and low mileage can result from improper adjustment, wear on internal parts, clogging, and corrosion.

2. TIME OUT OF ACTION—Time-out for service is not profit-time. Expert service, done quickly and thoroughly, puts trucks back on the road at peak operating efficiency.

3. ROAD FAILURE—Faulty carburetion cuts down road speed, causes breakdowns. Consistent, expert service takes care of inexpensive repairs and adjustments that prevent costly delays.

The three enemies of fleet operation outlined above are real threats to your profits. But there is a simple and sure-fire way to defeat them. Zenith Authorized Service is daily proving to fleet operators that regular, specialized carburetor service pays off in dollars and cents!

Specially trained mechanics, with the correct tools and equipment, as well as adequate repair parts, perform cleaning, adjusting and repair operations at regular intervals.

Minor repairs are taken care of before they become costly repairs requiring lengthy layups. And failures in operation are practically eliminated—keeping your schedules right "on the nose".

Every carburetor is checked against the 9 Vital Points shown on the right. Check them over yourself, and you will see why Zenith Authorized Service pays off in profits!



LOOK FOR THIS SIGN
for prompt, thorough
carburetor service

EVERY ZENITH CHECK-UP INCLUDES THESE 9 VITAL POINTS
OF CARBURETOR MAINTENANCE:

1. Thorough cleaning of bodies and parts without injuring the corrosion-resistant dichromate finish on die castings.
2. Careful inspection of channels and passages to insure proper fuel flow.
3. Cleaning of small parts with special solvents which will not destroy calibrations of metering orifices.
4. Inspection of castings for warpage or distortion of surfaces. Precision resurfacing of faces when necessary.
5. Proper inspection of throttle shaft and bearing. Elimination of excessive air leaks.
6. Careful cleaning of idling system and properly inserting throttle plate in relation to idling port.
7. Inspection of vacuum system, accelerating pump, etc.
8. Inspection and proper servicing of float systems.
9. Complete checking after repairs, adjustments, and reassembly.

ZENITH
CARBURETOR DIVISION OF
696 Hart Avenue, Detroit 14, Michigan

Bendix AVIATION
CORPORATION

GUNITE



BRAKE DRUMS

\$\$\$ TALK

For over 15 years GUNITE Brake Drums have gradually been gaining nation-wide acceptance by proving that they *give more per dollar invested.*

It is true that in most instances you will pay more for a set of Gunite Brake Drums. However, the additional cost is justified by better quality material, better design, and longer life with lower maintenance costs. In the long run, Gunites will prove to be the *cheapest drums you can buy.*

Practically all Gunite installations on truck and bus fleets have been sold on this basis. The usual practice for a user considering a switch to Gunites is to install a complete set and make a comparison of total costs over a suitable period. (Incidentally, it is

important to install a full set and not just on one pair of wheels, of which we will have more to say in a following advertisement.) This will give the true picture on the overall savings made by switching to Gunites.

There are good reasons why Gunites will prove superior on every basis — cost per mile, lining life, brake efficiency, and interval between adjustments. The metal is specially processed and alloyed to give high tensile strength, correct Brinell hardness, self lubrication with 80 points of free graphite, and the highest modulus of elasticity found in brake drum materials. Add specially engineered designs which include heavy cast ribs (not machined grooves) and accurate finish machining in our own shop and you have the distinguishing features that mean lower overall brake costs to Gunite users.

Topping all this is a new purchasing plan by which you can gain further savings on the original cost. By ordering through your jobber on a "direct factory shipment" basis (with a price scale based on quantities purchased) you can save 25% over stock he must handle and carry on his floor. *Ask your jobber about the Gunite Direct Factory Shipment Plan and learn how you can now get high Gunite quality at new low cost.*

Let Gunite Brake Drums talk dollars by proving their economy in actual service!

MADE BY
GUNITE FOUNDRIES
ROCKFORD, ILLINOIS



GUNITE BRAKE DRUMS...FOR TRUCKS, TRACTORS, TRAILERS, and BUSES

The Ring that keeps 'em Rolling **LONGER...**



Fifty-one famous builders of engines for fine aircraft, motor cars, busses, trucks, tractors, marine and industrial power plants now use Wausau precision rings.



Outboards



Trucks



Airplanes



Industrial Engines



Marine Engines



Busses



Tractors



Passenger Cars

WAUSAU MOTOR PARTS CO. • 2400 Harrison Street • Wausau, Wisconsin

Wausau precision piston rings will positively keep motors running longer with plus power and economical oil regulation.

That's why more and more smart mechanics who use them all the time have earned the reputation as "the men who know how to do the best job on a sick, smoking motor". That's why truck owners who used Wausau's once will never accept less efficient rings. They've standardized on Wausau rings.

BECAUSE

There is no tricky tension—no harsh pressure—no carbon clogging—no dangerous drag—no slots to trap carbon. The Wausau safety center unit resists carbonization.

BECAUSE

There is no fragile iron spacer to break. They are easy and simple to install. The motor starts easily — no crank tugging — no towing.

BECAUSE

Wausau has the right rings for any condition of cylinder wear—tailored sets—engineered exactly for every engine—distinguished by the amazing lubrication control of the Wausau Oil-Savr.

Write us for information.



WAUSAU *Oil-Savr*

THE FREE-RUNNING RING WITH
THE SAFETY CENTER UNIT

TANK CREWS AND TRUCK DRIVERS need Clear Vision!

Tank observation windows save lives and assure greater fighting efficiency.

Clearer Vision — *through glass* — also is vitally essential for truck drivers — yet it's amazing how many drivers suffer eye fatigue because the glass in their windshields needs replacing. Fatigue increases the risk of damage to freight and equipment!

This is why it's so important to make all replacements with genuine Libbey·Owens·Ford Clear Vision, Hi-Test Safety

Plate Glass — because *this* plate glass is specially ground and polished for clearer vision, and maximum freedom from annoying distortion. It's safer too, because L·O·F uses a super-tough plastic interlayer!

Give greater protection to your drivers and trucks this sound way! Check your fleet NOW for cracked or discolored glass. When you order replacements, specify Libbey·Owens·Ford Safety Plate Glass. It's an important aid to safer driving! Libbey·Owens·Ford Glass Company, 4625 Nicholas Building, Toledo 3, Ohio.



LIBBEY·OWENS·FORD
a Great Name in GLASS

Introducing
our own
Man of
The Year



Meet Mr. Winslow Oil Conditioner. Important little gent, isn't he? And well he should be, for he has completed the most important year of his career.

In 1944 the nation completed the heaviest transportation job in its history. And



Proof in Use

The famous Hall-Scott model "400" truck engine which powers the Army's giant tank retriever is factory equipped with Winslow Oil Conditioners.

more insistently than ever, maintenance men, engineers and operators demanded Winslow Oil Conditioners to protect their lubricating systems against motor-destroying substances.

Tests have proved that black, sticky, carbon-and varnish be-smudged pistons with stuck rings can be cleaned without being removed, and maintained clean with Winslow elements being replaced as needed.

Winslow Replacement Elements—in more than 130 sizes made to fit any standard filter—clean oil quickly and thoroughly. Through the use of an exclusive design, Winslow oil conditioning elements are made to *Expand with Use*, thereby retaining their porosity and efficiency. This actually means longer life.

14-WE-13-V



WINSLOW ENGINEERING COMPANY, OAKLAND 8, CALIFORNIA

WINSLOW

FUEL FILTERS • OIL CONDITIONERS • ELEMENTS



When the good news comes on **DURO-CHROME**

These "Doggone Good Tools" Will Be Better Than Ever



When you can again walk into your dealers and pick out all the Duro-Chrome tools you want for shop or home, you've got a treat in store! For on the new Duro Boards will be arrayed the finest Duro-Chrome Tools ever built. From start to finish they'll be pre-war quality plus! Of course the sockets will be hot broached as they have been all through the war. Hot Broached sockets are best because the tears, stresses and cracks resulting from cold broaching are eliminated. Of course they'll have the durability and precision which have characterized Duro Tools for nearly thirty years! But in addition, there will be advancements resulting from Duro's greatest tool production in history in supplying the needs of our war production industries and our armed forces. Limited supplies of Duro Tools are available today for your essential needs . . . see your Duro distributor for details. **Duro Metal Products Company, 2649 N. Kildare Ave., Chicago 39, Illinois.**

DURO TOOLS (HAND TOOL DIVISION)
The Mechanic's Best Friend
OVER A BILLION BUILT SINCE 1916
ALSO MAKERS OF DURO® MACHINE TOOLS

PLOMB

SCREWDRIVERS ARE HUSKIER!



**NOW YOU'RE SET AGAIN FOR
PLENTY OF EXTRA MILES. THIS
TUBE IS REPAIRED BY THE
SPEAKER SYSTEM**

**RIGHT! EVERY SPEAKER
MATCH PATCH REPAIR IS
STRONGER THAN
THE TUBE ITSELF**



SPEAKER MATCH PATCH VULCANIZED REPAIRS KEEP PAY LOADS ROLLING!

THREE'S no better proof of lasting performance than the fact that SPEAKER Vulcanizing Repair Units are being used by the millions to help keep our mechanized forces on the go. And just as they are doing such a great job in all parts of the world, in desert heat or biting cold of north countries, they are giving outstanding performance on the vital transportation fronts all over this country.

These wartime days it's more important than ever to avoid lost time of your manpower and equipment just because ordinary tube repairs fail. Take a tip from Uncle Sam — equip your shop and every car and truck with SPEAKER Match Patch Vulcanizing Repair Units. They assure safe, dependable repairs — enable you to get every possible extra mile out of your tires.

You can be certain to "keep your rolling stock rolling" — with SAFETY and on schedule by getting SPEAKER MATCH PATCHES from your jobber in the handy "Shop-and-Road Service Group Packages" . . . Round, Oblong, Giant Oval.



J. W. SPEAKER CORP.

3059 North Wall Street, Milwaukee 12, Wisconsin
Canadian Speaker Corp., Ltd., Montreal

"BODY-WISE"

they prefer . . .

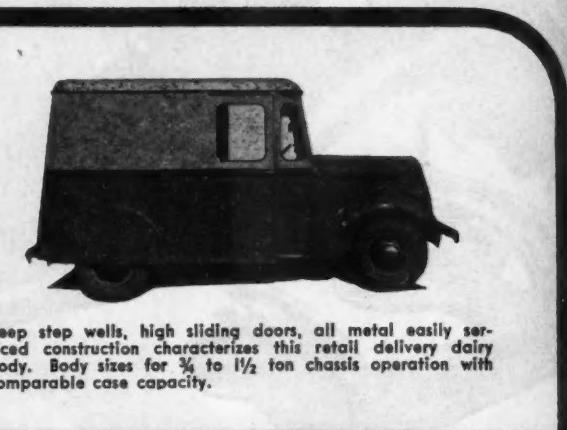
YORK-HOOVER BODIES

Designed and built "to take it" — York-Hoover Bodies cut per package delivery costs thru individual attention to fleet requirements, plus accumulated body-building experience covering a period of 53 years.

Be "Body-Wise"! Consult York-Hoover



A small body on a $\frac{1}{2}$ ton chassis designed to solve a definite retail delivery problem for a bakery customer. Unique interior rack arrangement facilitates working out of hampers.



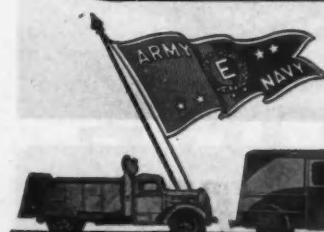
Deep step wells, high sliding doors, all metal easily serviced construction characterizes this retail delivery dairy body. Body sizes for $\frac{3}{4}$ to 1 $\frac{1}{2}$ ton chassis operation with comparable case capacity.



Light weight, all metal body construction that will handle maximum loads economically require skillful engineering and precision manufacturing. Beverage bodies particularly need this preliminary thought for successful operation.



Wholesale or bulk carrying bodies demand careful study to properly fit them into a fleet operation. Job to be accomplished, weight factors, construction and servicing all contribute to low cost transportation.



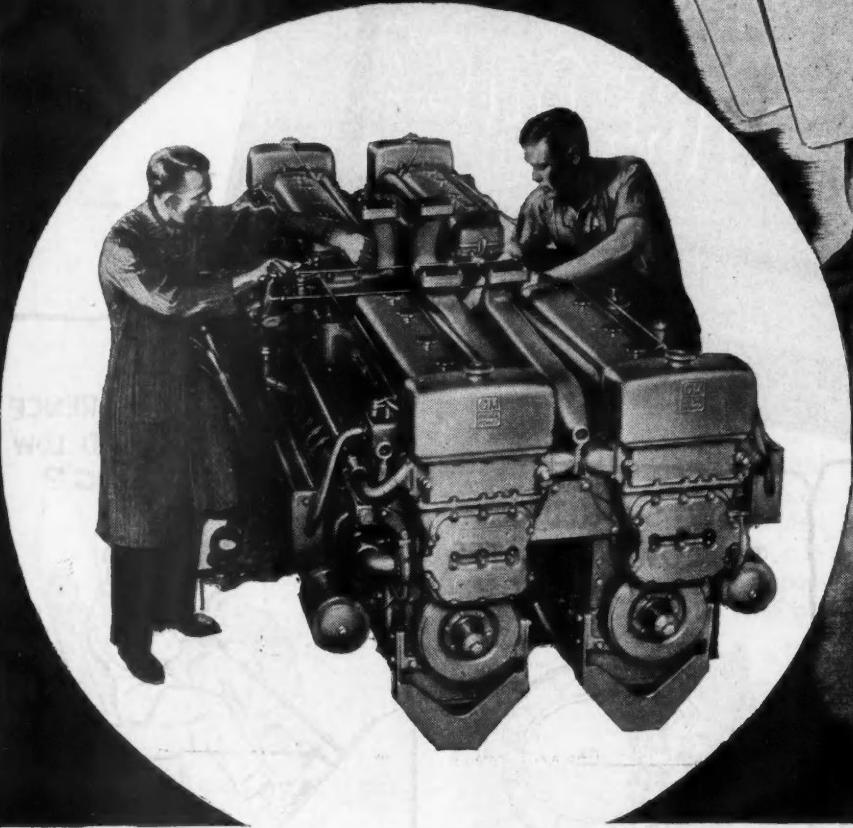
BODY DIVISION

YORK-HOOVER CORPORATION



YORK, PENNSYLVANIA

FOUR OF A KIND



Here is a power unit made up of four General Motors Series 71 6-cylinder Diesel engines driving a single shaft. The unit may be operated on one or more of the engines, as required.

It's called the "Quad," and two of them power each of the famous LCI landing boats. Quads save space and weight so more troops, equipment and fuel can be carried.

Half a "Quad"—two 6-71 engines mounted side by side—is a "twin," and these power Army tanks and tank destroyers.

Here is economical power for many postwar uses—power at less than 15 pounds per horsepower—power for applications where space and weight are at a premium.



America's highways had begun to know GM Diesel power well before the war. In the days to come its long mileage on inexpensive fuel, long engine life, long periods between overhauls and steady keep-on-the-go operation will set new standards of low-cost transportation.

*KEEP AMERICA STRONG
BUY MORE WAR BONDS*



ENGINES . . . 15 to 250 H. P. . . DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

ENGINES . . . 150 to 2000 H. P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

LOCOMOTIVES . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.

How do you rate
on this 49-second
BRAKE SERVICE QUIZ?

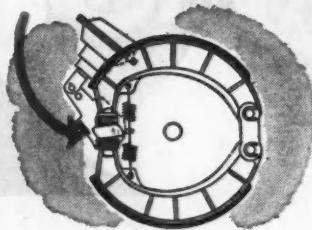
**WHY SHOULD WHEELS
KEEP TURNING
WHEN BRAKED?**



**HOW SNUG SHOULD A
BRAKE LINING FIT SHOE?**



**HOW SHOULD CAM
FOLLOWING PLATES
BE MOUNTED?**



**WHEN SHOULD
AN OVER-SIZED
LINING BE USED?**



**WHAT'S THE DIFFERENCE
BETWEEN HIGH AND LOW
FRICTION LINING?**



*Answers
ALL QUESTIONS*

The Johns-Manville Fleet Reliners' Manual is crammed with 80 pages of facts, diagrams, charts . . . of all well-known truck, bus and trailer brake systems. Invaluable, for beginners, handy for experts! For your copy, write: Johns-Manville, New York, Chicago, Cleveland, St. Louis, San Francisco.

JOHNS-MANVILLE
JM
PRODUCTS

GULF DIESELUBE H. D.

...when heavy duty demands
an oil that can take it!

Trucks pounding the road can dish it out to an oil—and *Gulf Dieselube H.D. can take it!*

That's what fleet operators tell us about this new oil, especially made for improved lubrication of high-speed, automotive-type Diesel engines, and for gasoline engines operating under heavy-duty conditions.

Gulf Dieselube H.D. is a quality lubricating oil of high detergency that protects engines from punishment by *helping to keep them clean*. It holds carbon and sludge-forming materials in suspension, prevents harmful deposits on rings and pistons. And it's

noncorrosive to all types of alloy bearings, including those of copper lead and cadmium silver.

Gulf Dieselube H.D. is being used in gasoline and Diesel engines in trucks, busses, jeeps, tanks, tractors, and many other kinds of Army ground equipment—giving an excellent account of itself. It meets U.S. Army Specification 2-104B in every respect.

And here at home, this high-quality oil is saving time and money in all kinds of heavy-duty commercial bus and truck operations. It is approved or recommended by leading manufacturers of Diesel and gasoline engines.

Get Gulf Dieselube H.D. for your own equipment. Write, wire, or phone your nearest Gulf office today.



Other Gulf lubricants for heavy-duty service

Gulflex Chassis Lubricants
Gulflex Wheel Bearing Grease
Gulflex Universal Joint Lubricant
Gulflex Waterproof Grease

Gulflex Graphite Spring Lubricant
Gulf Transgear Lubricant E. P.
Gulf Transmission Oils
Gulf Hypoid Gear Lubricant 90

Gulf Oil Corporation • Gulf Refining Company

DIVISION SALES OFFICES: Boston—New York—Philadelphia—Pittsburgh—Toledo
Louisville—Atlanta—New Orleans—Houston

SAFEGUARDED QUALITY

The traditionally high quality of every Willard Battery is triply safeguarded . . . first, by the unusual care exercised in selecting materials . . . second, by high standards of workmanship, inspired and maintained by veteran Willard craftsmen . . . third, by the 74 factory tests and inspections which every Willard Battery must pass. When you buy Willards, you buy wisely . . . because you buy safeguarded quality.



"SAFETY-FILL"
COMMERCIAL AND
DIESEL BATTERIES

Willard



Army-Navy "E", awarded to
the Willard Storage Battery
Company, Cleveland Plant,
for high achievement in the
production of war material.

Willards at war: in Tanks • Combat Cars • Jeeps • Walkie-Talkies
• Ships—and in Cars, Trucks, Tractors and Buses at home

... the power to carry on !

WILLARD STORAGE BATTERY CO. • CLEVELAND • LOS ANGELES • DALLAS • TORONTO



More Ford trucks on the road

On more jobs

For more good reasons !

TRUCK-ENGINEERED

FORD TRUCKS
AND COMMERCIAL CARS

TRUCK-ENGINEERED AND TRUCK-BUILT BY TRUCK MEN

... HOW TO BUILD LONGER LIFE INTO TOMORROW'S TRUCK AND TRAILER BODIES

When you plan new transportation bodies, plan for longer lasting, attractive appearance . . . specify Superior Galvannealed. This highly rust-resistant, zinc coated steel sheet has specific advantages for truck and trailer bodies. (See illustrations below.) It "takes" fine finishes readily, and "holds" them longer. Its high degree of workability saves time and encourages good workmanship. Contact your jobber for the availability of Superior Galvannealed in the gauges and sizes you require.

THE SUPERIOR SHEET STEEL COMPANY

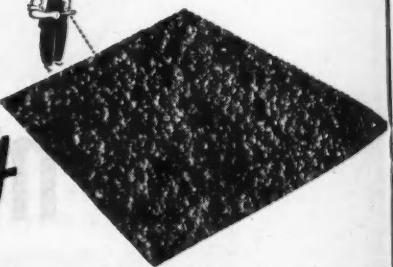
CANTON, OHIO

DIVISION OF CONTINENTAL STEEL CORPORATION

Long
Life



Paintability



This microscopic photograph of a cross section of Superior Galvannealed shows the alloy bond between the coating and base steel. This bond guards against rust under the paint and gives extra life to the finish and sheet itself.

This microscopic view, magnified many times, illustrates the "toothed" surface of Superior Galvannealed steel sheets. A patented heat treating process produces this ideal foundation for taking and holding paints and finishes.



SUPERIOR

CONTINENTAL STEEL CORPORATION
PRODUCERS OF STEEL SHEETS AND MANUFACTURER'S WIRE

AT LAST!

a truck tire with long recap life

Today the very life of your business depends on tires that can be recapped not only once—but time and time again. That's why truck owners are talking about the new Fisk Transportation Truck Tire—the tire that gives you more recaps per casing—more miles per recap.

New, more powerful rayon cord now goes into every ply and every impact pad to protect against internal failures, fight rupture growth. Service injuries remain small—repairs cost less—more tires can be recapped.

Now more rubber surrounds each cord in every ply. This greater "rubber-to-rubber" contact welds tread and carcass firmly together, protects against destructive separation. The result is more miles and more months of service—from the original tread to the last recap.

Yes—with this combination of big, powerful cords and more "rubber-to-rubber" contact, each new Fisk Transportation Truck Tire not only does its work better than ever before—it does it on fewer plies. Insist on Fisk—the truck tire with long recap life.

NEW, MORE POWERFUL RAYON CORD . . . protects against internal injuries...fights rupture growth. More tires can be recapped. Repairs cost less.

GREATER "RUBBER-TO-RUBBER" CONTACT . . . welds tread and carcass more firmly...guards against tread separation, adds months of recap life.



TIME TO RE-TIRE
Reg. U. S. Pat. Off.

FOR MORE RECAPS
PER TIRE . . .
MORE MILES PER RECAP . . . get a **FISK**



Those drivers' seats in the trucks of your fleet will be filled . . . soon, we hope . . . with men who have come back to their jobs from the exciting theaters of war.

They will recognize the need for lighter, faster, more economical truck bodies . . . for speedy, dependable delivery of consumer goods.

Why not insure leadership for your fleet in the postwar period by planning on DE KALB bodies . . . now? Write your problems. We will cheerfully send information. Our postwar production is being planned now. We will be ready to build the better truck bodies of tomorrow.

DE KALB
COMMERCIAL BODY DESIGNS UNION

Tomorrow's designs for Today
DE KALB, ILLINOIS



NO FUSS—NO MUSS
JUST POUR—NO MORE

Rust Master dissolves rust in the entire cooling system and Rust-proofs for a year—contains nothing harmful.

Six Master dissolves carbon—sludge and gum—relieves sticky valves and frees rings—saves gasoline.

Send for free preventive maintenance cost chart





400 MILES AND FRESH AS A DAISY!

Because Saginaw (Recirculating Ball-Nut) Steering Gears make steering so effortless, truck drivers can make long hauls over busy highways and through teeming city traffic and alight from their cabs still fresh and alert. • Progressive fleet owners who are interested in reducing driver fatigue and eliminating costly accidents and delays, operate buses and trucks equipped with Saginaw Steering Gears.

SAGINAW STEERING GEAR DIVISION
GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN

MANUFACTURERS OF STEERING GEAR ASSEMBLIES, STEERING LINKAGE ASSEMBLIES,
UNIVERSAL JOINTS AND PROPELLER SHAFTS, DIESEL ENGINE AND AIRCRAFT PARTS
• ORIGINATORS OF THE "BALL BEARING SCREW AND NUT" FOR ALL PURPOSES,

*If it's Easy to Steer
It's a Saginaw Gear*



RAYTEX FORTIFIED

DAYTONS GIVE PRE-WAR MILEAGE OVERLAND AT HIGH SPEED



The Fighting Heart
of a Dayton
Thorobred!

has been battle-proven on the beachheads, and now again over here, and now a mighty combination of new synthetic rubber and stronger, more heat-resistant Raytex Cords. They are welded together into an inseparable union. Thus they distribute and "take-up" road-shocks, impacts, and heat . . . prolonging tire-life. It is new tire-engineering of the Dayton Thorobred . . . fortification that assures the delivery of Pre-War mileage, overland at high speed.

Even under today's conditions, tires fortified by Raytex Cords are rivalling the mileage of pre-war tires, and doing it on the very toughest runs. They are Dayton Thorobred Tires.

Actual reports keep on coming in, direct from important fleet-owners, describing in detail the way today's Dayton Thorobreds can "take it."

Full capacity loads, tighter-than-ever schedules, runs day and night over mountains, long trips on hot straightaways . . . and "Overland at high speed" they say, "Daytons still give almost all of the good old pre-war mileage again." It is explainable only by Dayton's "Heart" of the Thorobred Tire.

It is a "heart" of famous Raytex Cords. These cords are more resistant to heat. They generate less heat themselves, being lighter in weight, and more resistant to flexing. And they retain their greater tensile strength at unusually high road temperatures.

By a special process, these far stronger and far "cooler running" Raytex Cords are welded inseparably together with new synthetic rubber. Then all cords support and fortify each other. And thus "distribute" road-heat and road-shocks throughout the carcass of the tire.

Such a "heart" costs Dayton more, but it prolongs tire life, amazingly. And explains, too, why with Dayton Thorobreds blowout trouble is rare.

Countless fleet-operators all over the country, are getting the same longer mileage today, practically the same good old pre-war more-mileage-per-dollar, from Dayton Thorobred tires. And still have carcasses left that are excellent for recapping, and then many extra miles.

So although their supply is still limited, keep your eye peeled for a Dayton. Although more of them than ever are still demanded overseas, you may find some available. When you do, pick them up. They will help you, too, to maintain overland schedules, and still give you practically all of the same good old Pre-War mileage again.

THE DAYTON RUBBER MFG. CO.
Co-Operators of a Government Synthetic Rubber Plant
DAYTON 1, OHIO

* KEEP ON BUYING WAR BONDS *

Dayton Processed Rayon Cord

Tires by

Dayton
REG. TRADE MARK
THE DAYTON RUBBER MFG. CO.
Rubber

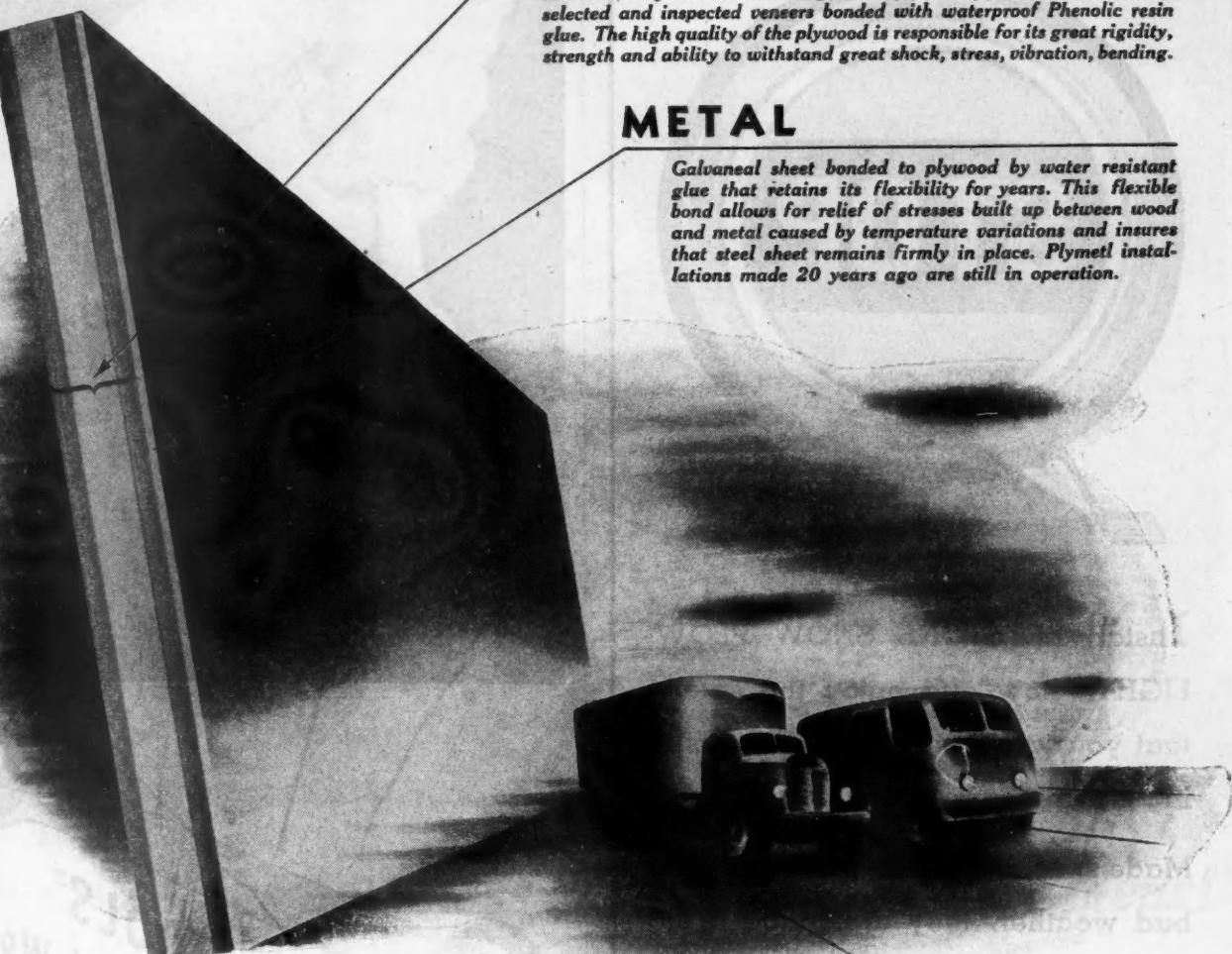
The Mark of Technical Excellence in Synthetic Rubber

PLYWOOD

A structurally balanced and engineered plywood plaque of high quality selected and inspected veneers bonded with waterproof Phenolic resin glue. The high quality of the plywood is responsible for its great rigidity, strength and ability to withstand great shock, stress, vibration, bending.

METAL

Galvaneal sheet bonded to plywood by water resistant glue that retains its flexibility for years. This flexible bond allows for relief of stresses built up between wood and metal caused by temperature variations and insures that steel sheet remains firmly in place. Plymetl installations made 20 years ago are still in operation.



Team-mates for Transportation

Longer life Haskelite Plymetl combines the inherent structural advantages of high quality plywood with metal for constructing more efficient and practical transportation vehicles. Plymetl is lighter, less expensive and saves man hours in its application.

In trucks and trailers weight savings up to one-half ton per unit have been effected allowing this much more payload on every trip.

Plymetl's high Quality also contributes greatly to the

life and appearance of trucks and trailers. It will not ripple, wave or buckle, it cuts vibration and noise, and is highly dent-resistant. Backed by Haskelite's 27 years of know-how and experience, Plymetl becomes the material most in demand by men who appreciate and aim for top efficiency in their truck and trailer operation.

Specify Plymetl, available in prefabricated sheets or panels for doors from the larger truck and trailer manufacturers. Write Haskelite for complete details.



PLYMETL

HASKELITE MANUFACTURING CORPORATION
DEPT. TC-1 - GRAND RAPIDS 2, MICHIGAN

NEW YORK CHICAGO DETROIT ST. LOUIS
CANADA : Railway & Power Engineering Corp., Ltd.



Install KEYSTONE SNOW PLOW LIGHTS now and enjoy the safety that you will have with these flashing warning signals.

Made specially for Highway work in bad weather, they are made to fit your needs, won't shake apart, water can't get in and short them out. They're long lived and a good investment for every Highway Department, large or small.

IMMEDIATE DELIVERY

**KEYSTONE LIGHTS
FLASH TO FRONT & REAR**

AUTO GEAR & PARTS CO.

1446 WEST HUNTING PARK AVENUE, PHILADELPHIA, PA.



Williams wrenches are charged in the forging with a double duty: to get you out of the repair shop in a hurry, and keep you out.

Williams tools have been doing just that for over sixty years. Made for precision, strength, hard service, and long wear. Treated with due respect, in skillful hands, they will outlast the equipment they service.

J. H. WILLIAMS & CO. • BUFFALO 7, N.Y.

The booklet, "How to Select and Use Wrenches," will make you better acquainted with tools, and give you some helpful hints. Write for it.

WILLIAMS
DROP-FORGINGS AND
DROP-FORGED TOOLS



fredric sweeney

"Mr. Leece, the horseless carriage needs your ideas!"

THERE WAS MONEY in the pocket of S. M. Neville. Besides, he owned a "horseless carriage" and a motor boat.

There were ideas clamoring for expression in the head of B. M. Leece, electrical contractor and inventor.

A chance meeting. Neville sees promise in Leece's ideas for new types of electrical equipment—agrees to have them tried on his "horseless carriage" and his boat. They work . . . money and ideas join . . . a new industry is born!

* * *

This month, The Leece-Neville Company observes its 35th anniversary, steeped in the business of providing vital electrical equipment for the implements of war. Cranking motors, generators and regulators for trucks and buses . . . cranking motors, generators, regulators and switches for marine and land type Diesel engines . . . generators, regulators, switch relays and pump motors for aircraft. Everywhere, however used, these products are living up to the high quality standard set by B. M. Leece and S. M. Neville when they organized their company back in 1910.

Concentrating always on making its equipment better, Leece-Neville has introduced a continuous stream of new products and product improvements, many of which have set the pace for their entire industry.

And now, looking ahead from today's milestone, Leece-Neville promises its old customers and its prospective customers that it will continue this program of pioneering new developments . . . that it will continue to build the utmost quality into everything it makes.



35th Anniversary
The LEECE-NEVILLE Co.
CLEVELAND, OHIO
Pioneer and still Quality Leader
in heavy duty electrical equipment

FOR TRUCKS AND BUSES SPECIFY LEECE-NEVILLE
CRANKING MOTORS, GENERATORS, VOLTAGE REGULATORS

THIS DUGAS SCREEN



SHIELDS FIRE-FIGHTERS

• Dense clouds of fire-killing dry chemical create a real "heat-shielding screen" for the operator whenever a DUGAS Fire Extinguisher, charged with PLUS-FIFTY DUGAS Dry Chemical, is used to beat down a blaze.

All DUGAS Fire Extinguishers—large and small—are designed with fire-fighter protection as well as fire-fighting effectiveness in mind—a big reason why workers who may have to be fire-fighters feel more confident when they see DUGAS equipment close at hand.

Non-toxic, non-corrosive and non-abrasive. Approved by Underwriter's Laboratories and Factory Mutual Laboratories.



ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN
DUGAS DIVISION

the complete line

THAT COMPLETELY SATISFIES



...FITZGERALD
BULLDOG GASKETS
FOR
HEAVY DUTY

I

IN the line of gaskets and grease retainers, Fitzgerald offers everything needed to keep your fleet functioning at peak efficiency.

Fitzgerald products are made by a company with 39 years' experience in building superior gaskets. They are notable for materials of only the highest quality, and for skilled workmanship.

The Fitzgerald Bulldog Gasket is especially designed to measure up to the most severe demands of modern heavy duty service. It is a tougher gasket for a tough job.

For prompt service on Fitzgerald Gaskets and Grease Retainers, see your jobber.

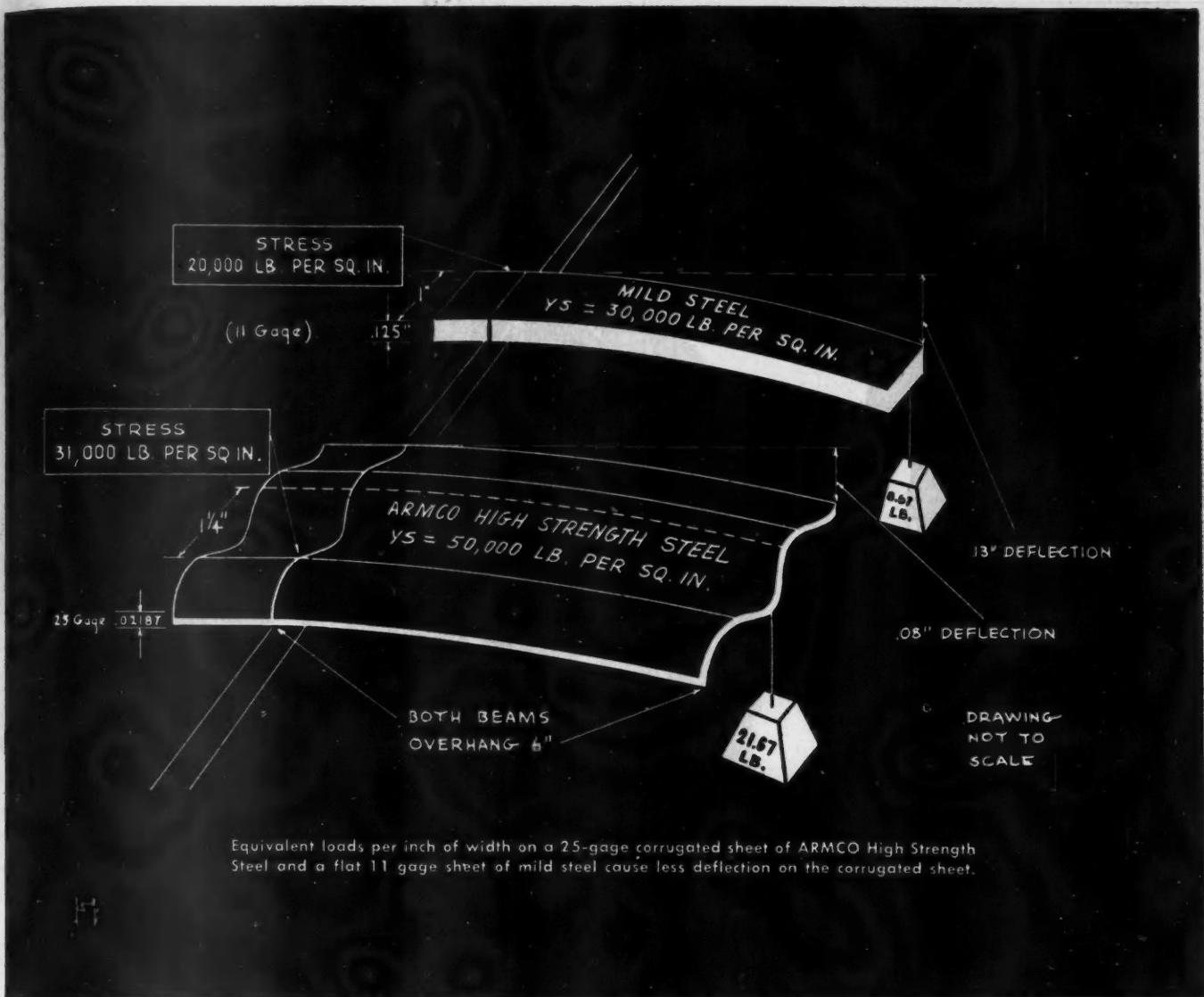
The
FITZGERALD MANUFACTURING COMPANY
Torrington, Conn.

Branches: Chicago, Los Angeles
Canadian FITZGERALD, Limited, Toronto

FITZGERALD

GASKETS

THE COMPLETE LINE THAT COMPLETELY SATISFIES



How to Take "Dead Weight" OFF YOUR TRAILER FLEETS

Higher yield strengths of ARMCO Low Alloy High Strength Steels give engineers an opportunity to create designs that enable trucks and trailers to deliver greater payloads with less dead weight.

The drawing illustrates one method of utilizing these higher yield strengths. A thin 25 gage corrugated sheet of ARMCO High Strength Steel weighted with 21.67 pounds deflects less than a thick 11 gage flat sheet of mild steel weighted with an equivalent load per inch of width of 8.67 pounds. Because of its higher yield strength it is practical to stress the High Strength Steels to 31,000 psi. as compared to 20,000 psi. for mild steel.

This increased rigidity can be achieved in other ways than by corrugations. Sometimes the sheet is

ribbed or embossed, or separate rib-stiffeners are used. These may be used in such forms as angles, channels or hat-sections. In monocoque, or "frameless" construction, the shell is usually reinforced against buckling by ribs or "stringers" between bulkhead rings.

Besides being stronger, ARMCO 50Y and 55Y High Strength Steels have greater resistance to atmospheric corrosion than ordinary steel.

There are other Armco products to help you operate your fleets more profitably after the war . . . Stainless Steels for appearance, strength and rustless construction; ARMCO PAINT-GRIP grades for long paint life; and



ZINCGRIP for complete zinc protection of severely formed parts. For complete information on any of these special grades just address The American Rolling Mill Company, 551 Curtis St., Middletown, Ohio.
EXPORT: THE ARMCO INTERNATIONAL CORPORATION

THE AMERICAN ROLLING MILL COMPANY



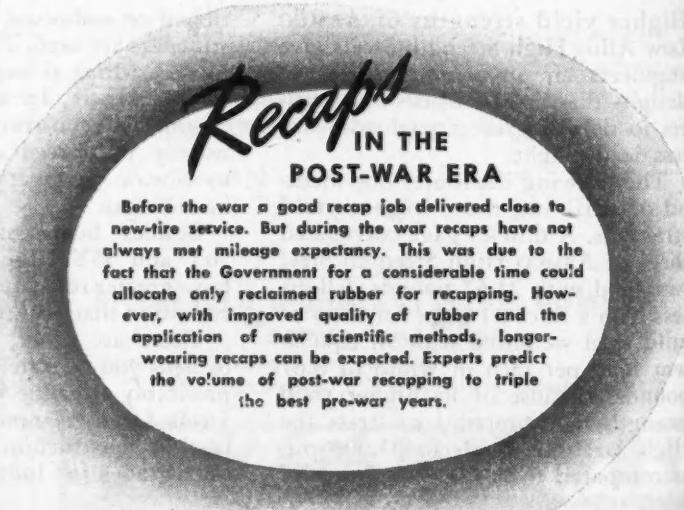
FLEET OPERATORS SING McCREARY'S PRAISE!

THOSE FLEET OPERATORS who keep a keen eye on tire costs sing the praise of McCreary Super Service and Super Transport Tires. They all say, "There's something about McCreary that rolls up more trouble-free miles at less cost per mile."

Of course, there's a definite reason for this performance. The best of materials—superior heat-resisting rayon cord, the finest American-made rubber, processed under the most scientific methods—plus careful handling, without time-saving shortcuts that impair quality, provide **stronger, more durable carcasses**.

Each McCreary Tire is checked, inspected and rechecked more than 40 times in the process of production—more good reasons why McCreary Tires give **more original miles—more recaps per casing—more miles on each recap . . . and cost less.**

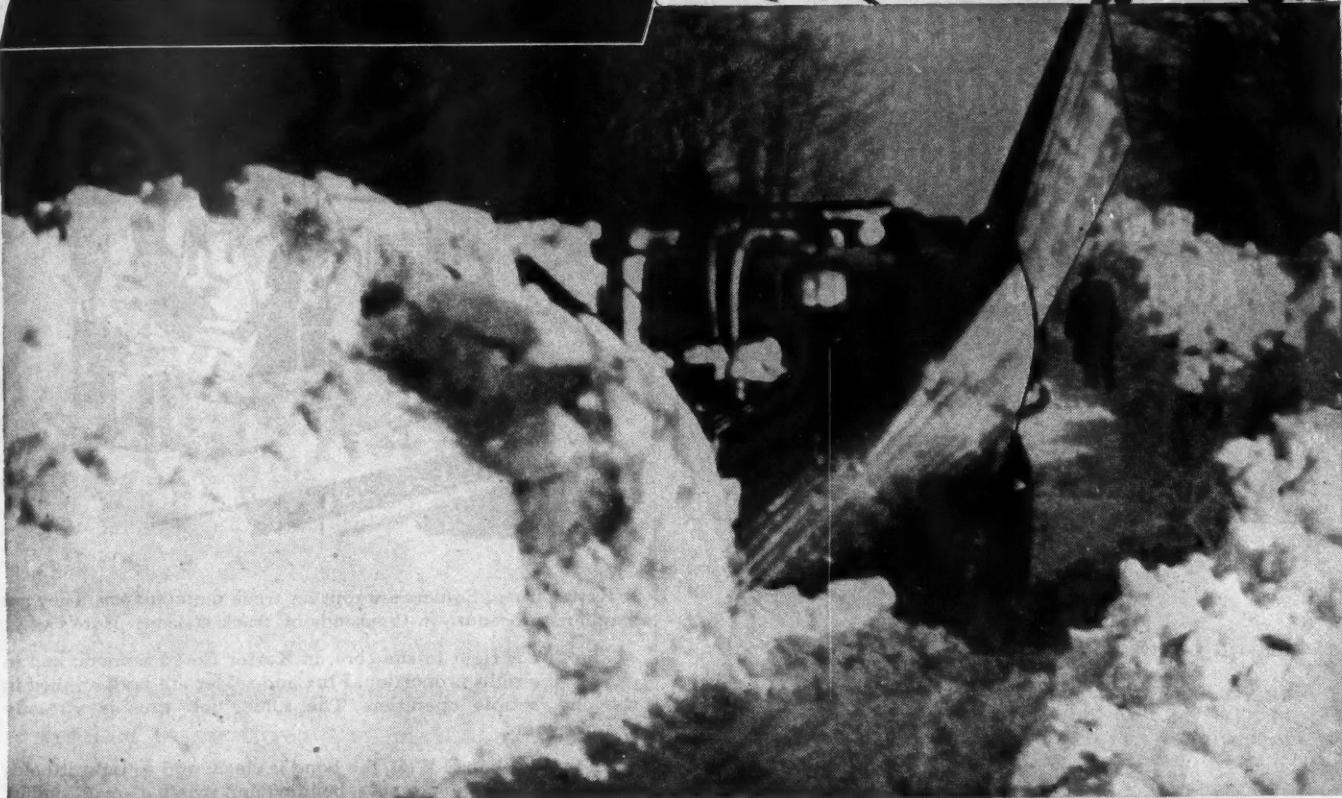
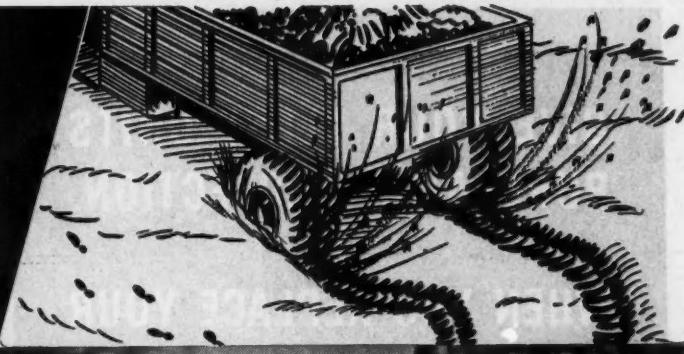
WRITE FOR THE NAME OF YOUR NEAREST DEALER



Before the war a good recap job delivered close to new-tire service. But during the war recaps have not always met mileage expectancy. This was due to the fact that the Government for a considerable time could allocate only reclaimed rubber for recapping. However, with improved quality of rubber and the application of new scientific methods, longer-wearing recaps can be expected. Experts predict the volume of post-war recapping to triple the best pre-war years.

McCREARY TIRE AND RUBBER CO. INDIANA, PENNA.

**NO SLIPS!
NO SPINS!
NO STALLS!**



**100% TRACTION MEANS FASTER CLEARING
with WALTER 4-POINT POSITIVE DRIVE!**

A truck without traction is helpless on snow, ice and slippery surfaces. Only Walter Snow Fighters have the positive traction which fully delivers tremendous motor power to FOUR driving wheels.

This traction is supplied by the exclusive Walter Four-Point Positive Drive. Three automatic locking differentials proportion power according to the traction of each wheel at any instant. Should one, two—even three—wheels momentarily lose traction, the mates carry on—eliminating the wheel-spinning, side-slipping and stalling that slow down or stop conventional trucks.

As a result, no other truck can match the performance of a Walter Snow Fighter. The 250 H.P. model, for example, hits speeds up to 30 m.p.h.—clears a two-lane road in one round trip—blasts through heavy drifts—removes snow before it packs and freezes into dangerous ruts—gains you extra time for opening more miles of secondary roads. For a complete story on the specialized engineering of Walter Snow Fighters, write for detailed literature today.

WALTER MOTOR TRUCK COMPANY
1001-19 IRVING AVE., RIDGEWOOD 27, QUEENS, LONG ISLAND, N.Y.

**WALTER
SNOW FIGHTERS**

GIVE YOUR FLEET UNITS
PUROLATOR PROTECTION.

★
WHEN YOU REPLACE YOUR
OIL FILTER ELEMENTS
BE SURE YOU INSTALL
GENUINE PUROLATOR
ELEMENTS . . . DON'T
ACCEPT SUBSTITUTES.



PUROLATOR PRODUCTS, INC., NEWARK 5, N. J.
founder and leader of the oil filter industry

PUROLATOR
THE OIL FILTER

Be "Solder-Sure" WITH KESTER CORED SOLDERS



• Kester Cored Solders are tops for truck maintenance. They are standard procedure in thousands of truck stations. Here's why:

• The flux is right in the core, in Kester Cored Solders; and in exactly the right proportion. Flux and solder are both applied in the one, simple operation. The solder job thus is virtually mistake-proof.

• And solder-bond? Well, the bond is clean; and so tight it holds fast against vibration, shocks, bending and twisting—even against contraction and expansion resulting from extreme temperature changes. And it typically outlasts the trucks or parts where used.

• You'll want both kinds of Kester Cored Solders in your shop to be absolutely sure of solder results. You'll want *Kester Rosin-Core Solder* for electrical work, because the patented, plastic rosin flux will not injure insulation or cause corrosion. Danger of short circuits is eliminated. Terminals are permanently protected.

• For general work you'll want *Kester Acid-Core Solder*. The patented core will not leak. The flux will not gather moisture. Unless yours is one of the thousands of shops that have standardized on Kester Cored Solders, start right now. Order from your wholesaler, and be solder-sure.

KESTER SOLDER COMPANY
4205 Wrightwood Avenue, Chicago 39, Ill.

Eastern Plant: Newark, N. J.

Canadian Plant: Brantford, Ont.

★ BUY WAR BONDS ★

KESTER
Cored Solder
FOR EVERY AUTOMOTIVE USE

*There's
been a
big change*



THE old-time "carry-all" got 'em there and brought 'em back. But ever-increasing demands of travel have resulted in improved transportation today.

Bearing demands have increased, too. A change was inevitable. Tyson achieved a big improvement by developing a tapered roller bearing with 30% more rollers around the raceway.

The Tyson "All Rolls" Bearing stepped up performance in two ways: 1. It greatly increased load-carrying capacity. 2. It practically doubled bearing life.

Operators of heavy-duty equipment say Tyson is the most advanced, the toughest, the longest-lived bearing ever built.



TYSON BEARING CORPORATION • MASSILLON, OHIO

COUNT THE ROLLS • THE ROLLS COUNT

Tyson
TODAY'S HEAVY-DUTY BEARING



★ BUY MORE WAR BONDS ★

**FOR TOP BRAKE
PERFORMANCE
*under all driving
conditions***



USE DELCO SUPER 9 BRAKE FLUID

Delco Super 9 brake fluid's superiority is based on the simple fact that it meets all the fundamental requirements of a superior brake fluid backed by automotive production and field experience:

1. Low vapor pressure—no "vapor lock" at extreme high temperatures.
2. Mobility at extreme low temperatures—no "hard pedal" in cold weather due to thickening of fluid.
3. No harmful effect on rubber parts—greater wear-life.
4. No corrosive action on metal, to restrict flow of fluid or functioning of parts.
5. Mixes satisfactorily with other commercial hydraulic brake fluids.
6. Chemical stability—fluid does not change in operation and time.
7. Reasonable in cost; satisfactory in service.

Delco Super 9 was developed by long research and laboratory experiments especially to meet these safety requirements. Its performance has been proved superior by laboratory tests and field service.

Use Delco Super 9 for better brake performance. Replace damaged or worn parts with Delco original-equipment replacement parts.

**Keep Attacking—
BUY MORE WAR BONDS**



Delco Super 9 brake fluid and Delco Brake replacement parts are distributed by United Motors Service and Bendix distributors.



STANDARD FOR EQUIPMENT—THE STANDARD FOR REPLACEMENT

ONLY

WAGNER Air Brakes

have the
ROTARY COMPRESSOR

*...That's Why They Are FIRST
in Economy and Reliability*

The Wagner Rotary Air Compressor used in Wagner Air-Brake Systems is one of the outstanding developments achieved in the field of automotive air-brake equipment. This revolutionary type of air compressor utilizes the rotary principle to compress the air needed in the air-brake system, and its high efficiency is largely responsible for the absolute dependability of Wagner Air Brakes.

POINTS OF EXCELLENCE OF THE WAGNER ROTARY COMPRESSOR...

- 1 . . . Rotary Motion—no reciprocating parts.
- 2 . . . Perfect running balance at all times.
- 3 . . . Longer belt life due to more uniform torque loading.
- 4 . . . Low friction losses—therefore high operating efficiency.
- 5 . . . A predetermined air pressure automatically maintained.
- 6 . . . Operating parts are long-lived; consequently long life and low maintenance cost.
- 7 . . . Extremely quiet in operation.
- 8 . . . Self-contained oiling system—consumes practically no oil.
- 9 . . . Compact—requires minimum installation space.
- 10 . . . Low operating temperature prevents carbon formation in the compressor and delivery lines.
- 11 . . . Wagner Air Brakes are adaptable to all types of automotive brake systems.

Thousands of Wagner Air Brakes are giving outstanding service on trucks, tractors, trailers, and buses—and are establishing enviable performance records. You, too, can lower brake maintenance and increase the brake efficiency of your vehicles by installing Wagner Air Brakes. Wagner is a national organization and can render field engineering service from any one of its 25 branches located in principal cities.

Write for Bulletin KU-50
IT CONTAINS COMPLETE INFORMATION.

K44-4

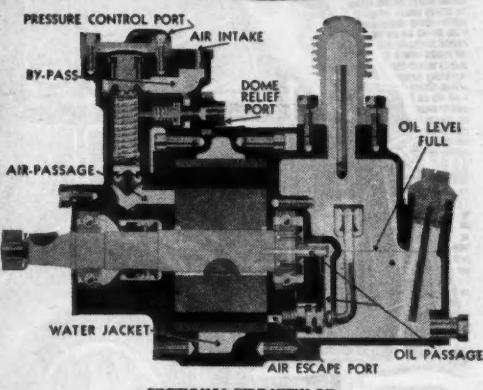
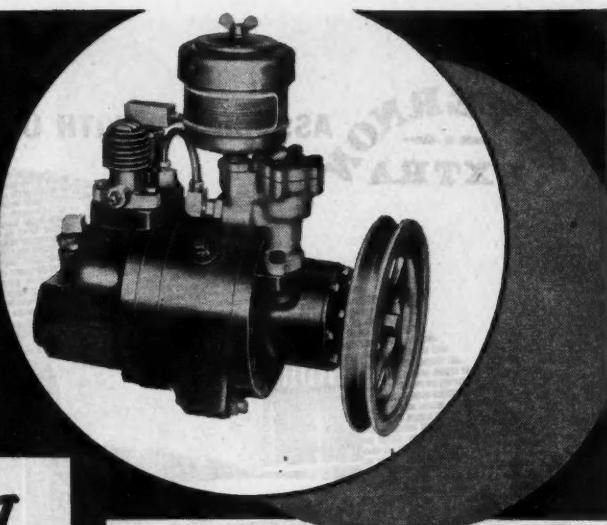


Wagner Electric Corporation

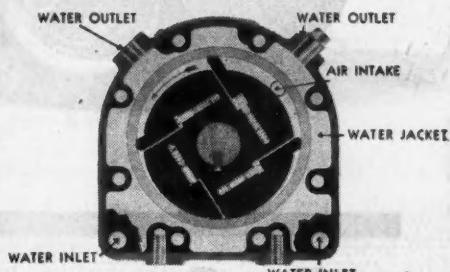
ESTABLISHED 1891

6470 Plymouth Avenue, St. Louis 14, Mo., U. S. A.

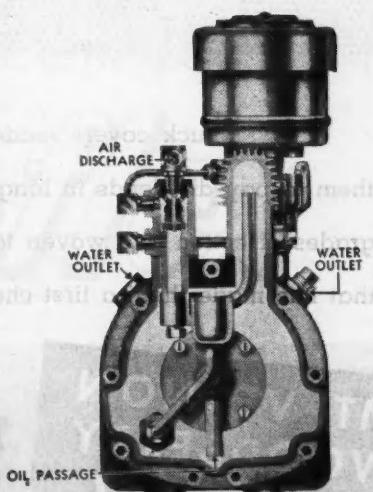
AUTOMOTIVE AND ELECTRICAL PRODUCTS



SECTIONAL SIDE VIEW OF COMPRESSOR ASSEMBLY



COMPRESSOR SECTION SHOWING ROTOR AND BLADE ARRANGEMENT



THE DOME END SECTION OF THE COMPRESSOR SHOWING OUTER CHECK-VALVE AND AIR-OUTLET TUBE ASSEMBLY

**MT. VERNON
EXTRA**

ASSOCIATED WITH UNIFORM QUALITY FOR OVER HALF A CENTURY



**For Covers with "wear-ability"
say MT. VERNON Extra**

Truck covers made from MT. VERNON Extra duck have a "wear-ability" that enables them to pay dividends in longer life and better cargo protection. Made from carefully selected top grades of cotton and woven to a high degree of uniformity, they have a toughness and stamina that has made them a first choice of buy-wise fleet owners from coast to coast.

**MT. VERNON
WOODBERRY
MILLS, INC.**

TURNER HALSEY COMPANY
Selling Agents

40 WORTH STREET * NEW YORK, N. Y.

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MECHANIC: "These fuel lines sure can take it, Joe!"

FOREMAN: "That's right...Titeflex will outlast the engine!"

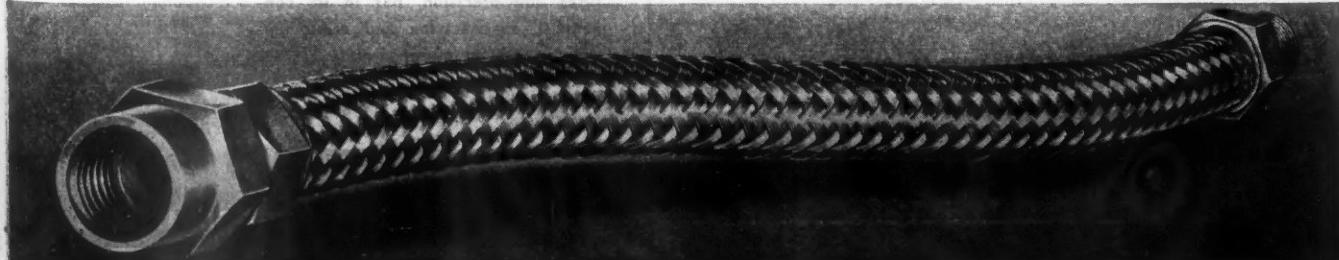
Well . . . perhaps Joe is a little too enthusiastic, but you'll be enthusiastic yourself the moment you switch to Titeflex *all-metal* flexible fuel lines for trucks and busses. Don't make the mistake of comparing Titeflex with other types of flexible lines. Titeflex is *all-metal* and as an extra precaution 4 thicknesses of metal are provided at the point of greatest wear. The protective metal cover is braided right onto the tubing itself. All the common causes of fuel line failure . . . vibration, corrosion, abrasion, high temperatures and the chemical action of oil and gasoline . . . have been engi-

neered out of Titeflex flexible fuel lines. The long, trouble-free life of Titeflex lines makes them the most economical fuel lines you can use.

Always associate the name Titeflex with the finest in flexible fuel lines. From their inception on the drawing boards of Titeflex engineers to their delivery to you, no effort has been spared to make Titeflex lines deliver superior performance in trucks, busses, and other heavy duty engines.

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Titeflex



MAINTENANCE

**SHORT CUTS
for
AUTOMOTIVE
SHOPS**

Lengthen Tire Life By Keeping Floors Grease-Free

When grease and oil are permitted to accumulate on garage, repair shop or service station floors, tires are exposed to rapid deterioration. For both grease and oil attack rubber, shorten its life, and cut down valuable tire mileage.

That is why more and more garages are giving close attention to maintaining floors in grease-free condition. And they are doing it the quick, easy, safe way . . . by cleaning them with that fast-working, time-saving material.

OAKITE PENETRANT

Just apply the recommended solution, allow it to soak for required period, brush floor lightly, then hose rinse. You'll notice that ALL deposits are speedily removed. Floors are left clean, bright . . . safe for tires.

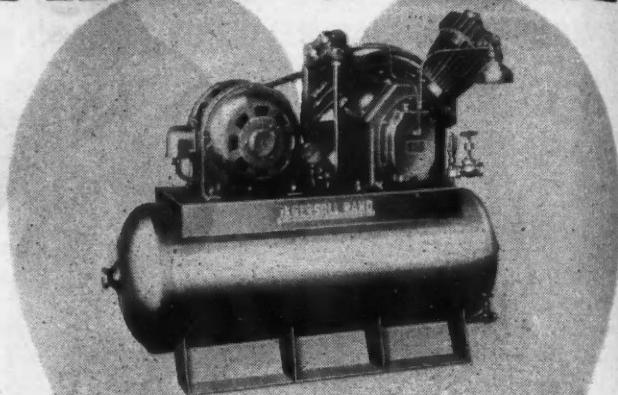
Available to you . . . entirely FREE for the asking . . . is a 36-page fact-filled booklet describing this and many other important maintenance cleaning tasks usually performed in service stations. Write for YOUR copy TODAY!

OAKITE PRODUCTS, INC., 26D Thames St., NEW YORK 6, N.Y.
Technical Service Representatives in All Principal Cities of the United States and Canada

OAKITE *Specialized* CLEANING

MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

AIR POWER



The compressor is the heart of your air system so be sure and install the best machine available. Ingersoll-Rand Type 30 Compressors offer years of trouble-free and economical service.

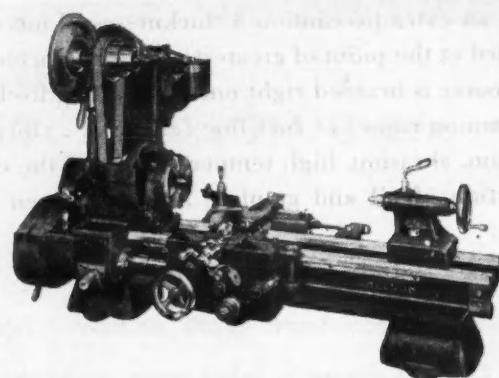
Machines are available in a number of sizes from $\frac{1}{2}$ to 10 horsepower. You can easily select just the right size to take care of your service and maintenance operations—operating your grease guns, paint sprayers, spring sprayers, car lifts, spark plug testers, fender straighteners, air tools, etc.

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Ingersoll-Rand

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SHELDON PRECISION LATHES

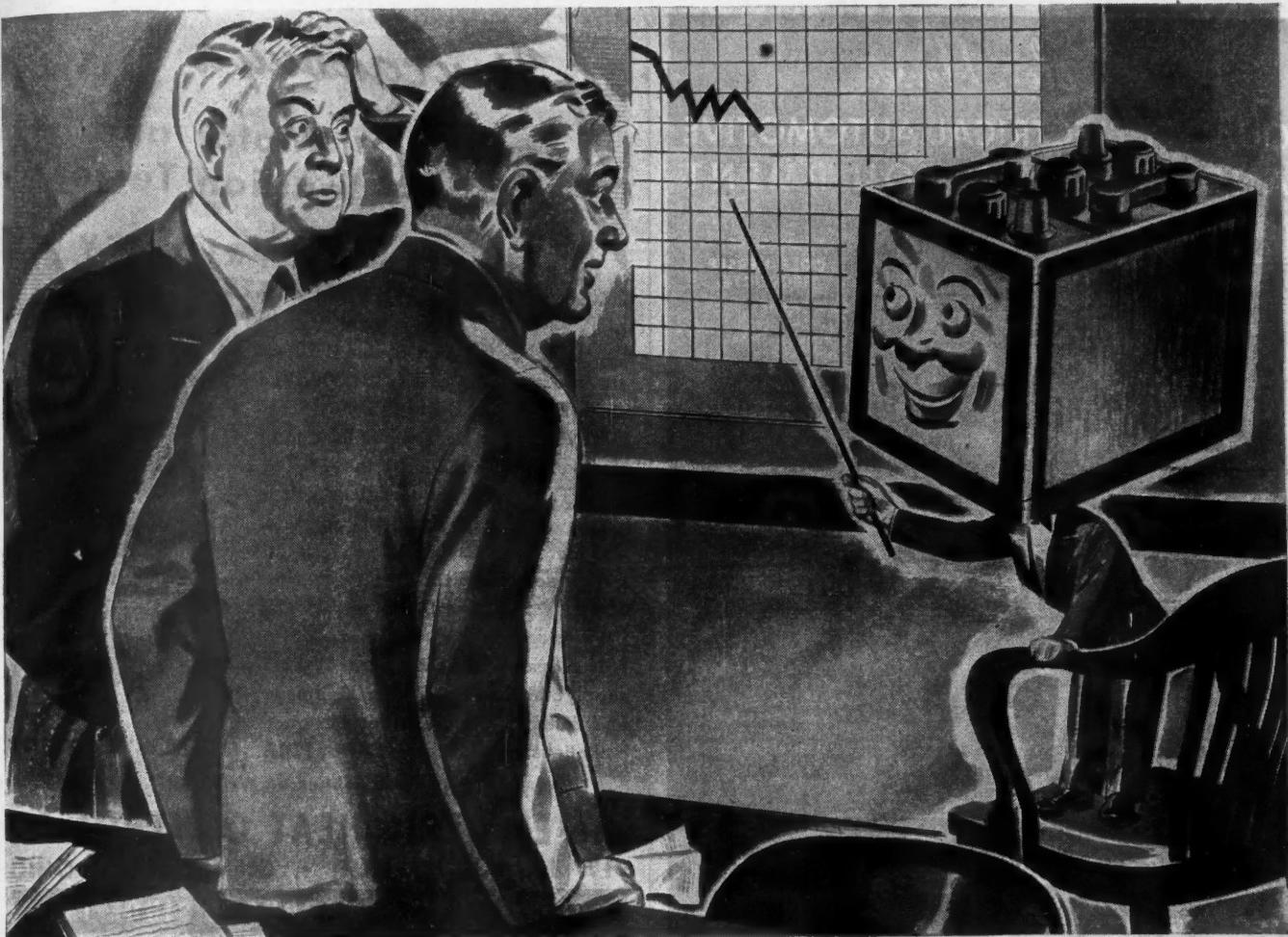


Among moderate priced lathes, the SHELDON 1026 BMWQ is not only superior in design, workmanship, features and precision, but in its convenient, space-saving and more efficient overhead motor drive . . .

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Mr. Hi-Q Helps Bolster Sagging Operations Curve

Mr. Hi-Q: Such faces, gentlemen! Come! Come! Things can't be as bad as that.

Fleet Manager: They're certainly not good . . . and they're getting worse. This winter weather is sure messing up our operations.

Mr. Hi-Q: If batteries have been one of your problems . . .

Fleet Manager: They definitely have!

Mr. Hi-Q: Why not start standardizing on *your manufacturer's top-of-the-line batteries?* They stand up better, last longer, and many fleet operators maintain that they cost less per mile in the long run.

Fleet Manager: Are they really so much better?

Mr. Hi-Q: Well, they have stronger plates, better separators, heavier cases, and most manufacturers equip their best batteries with Fiberglas* Retainer Mats.

Fleet Manager: And what do they do?

Mr. Hi-Q: Standard tests show that they greatly reduce battery failures formerly traceable to shedding of power-producing material from the positive plates.

Fleet Manager: Sounds interesting!

Mr. Hi-Q: These same tests show that batteries equipped with Fiberglas Mats last up to twice as long as the same batteries without the mats.

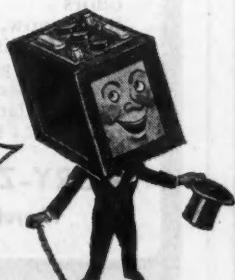
Fleet Manager: Did you say "twice as long"? That would be something.

Mr. Hi-Q: Suppose you ask your battery distributor about these better batteries . . . and be sure to mention that you want them Fiberglas-equipped.

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1960 Nicholas Building, Toledo 1,
Ohio. In Canada, Fiberglas Canada
Ltd., Oshawa, Ontario.



YOU CAN'T FIND A BETTER
BUY THAN THE BEST
BATTERIES—
FIBERGLAS-EQUIPPED



FIBERGLAS
*T. M. Reg. U. S. Pat. Off.
BATTERY RETAINER MATS

Cole-Hersee

QUALITY ELECTRICAL AUTOMOTIVE AND AVIATION EQUIPMENT



and many years front. Their dependability has been proved over a quarter of a century. That's Heavy Duty Construction is doing the job expected of them.

Only the best is good enough for Uncle Sam.



over a quarter of a century. That's Heavy Duty Construction is doing the job expected of them.

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PL-5



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Dash Lamps
Dash Switches
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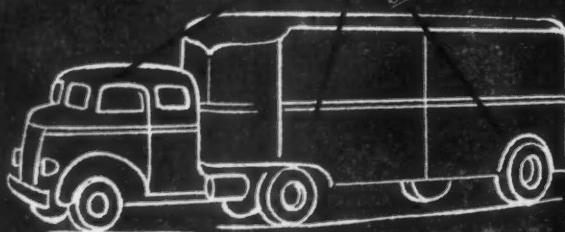
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Faster...
Better!*

With the
STERLING 1000
PORTABLE ELECTRIC
SANDER



Now... avoid tedious hand sanding on fenders, doors and other body work in your shop. Sand faster, more uniformly and economically with the Sterling Portable Electric Sander. Perfect for "feather-edging"; sands (coarse or fine), laps and polishes. Operates with exclusive orbital motion. Vibrationless, light-weight, simple to operate. Order from your local distributor, or write.

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You can buy a
"KING" Motor and
Ignition Tester
**NOW NO PRIORITY
IMMEDIATE DELIVERY**

By special permission of the WPB we are able to sell the "KING" MT-695 and make IMMEDIATE DELIVERY—WITHOUT PRIORITY from either Jobbers or Dealers. This applies to the MT-695 only. This opportunity enables you to obtain a complete ignition and motor analyzer that will enable you to locate trouble accurately and quickly. "KING" Motor Testers have been used all over the world for many years to enable repair shops to do better work. We can supply other "KING" Testing Equipment and Battery Chargers, within our quota limitations, on WPB Form 547 or PDIA.

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GOOD "KING" PRODUCTS SINCE 1914

For your Post-War
REFRIGERATOR TRUCKS
Specify

DRY-ZERO

IT'S THE FINEST INSULATION!

DRY-ZERO sheds water like a duck... can't absorb moisture by capillary action... SEVEN TIMES LIGHTER than commercial corkboard... doesn't rot, pack down or absorb odors... because it's made of CEIBA Fibre. Right now, Uncle Sam is using all available Ceiba for lifesaving equipment and aircraft... but when you plan your post-war refrigerator trucks, specify DRY-ZERO, the famous Ceiba Fibre insulation with the low thermal conductivity of only .24 B.T.U.

DRY-ZERO CORPORATION
Merchandise Mart, Chicago 54



A simple cold soak in Kelite Ketrex made the difference between these pistons.

Ketrex removes oils, grease, residual gums and light carbon. It is completely safe on all metals.

Kelite AAF Star does the same job with exceptional speed and is recommended where fast action is particularly desirable. Kelite Super Ketrex will give the desired results where carbon deposits are heavy. All three of these specialized cleaning materials are liquids delivered ready to use. No heating is necessary.

It's easy to see what Kelite does; and you can always count on the same clear-cut standard of safe, efficient cleaning with Kelite products. We hope you will always feel free to call on the nearest Kelite Service Engineer when you have difficult cleaning problems. It is his job to help you with scientific cleaning through pH Control.

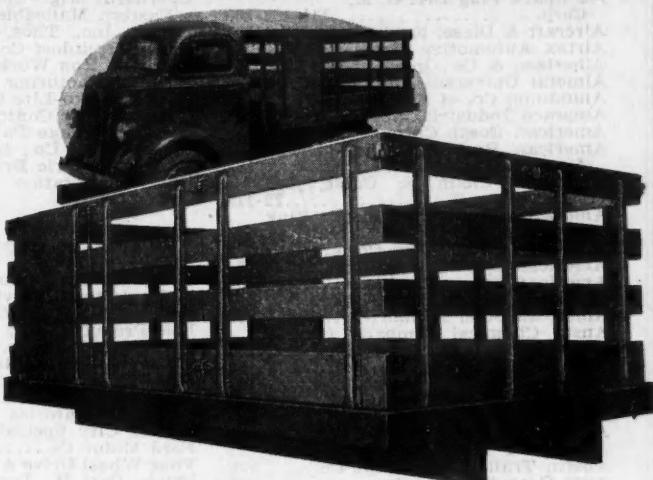
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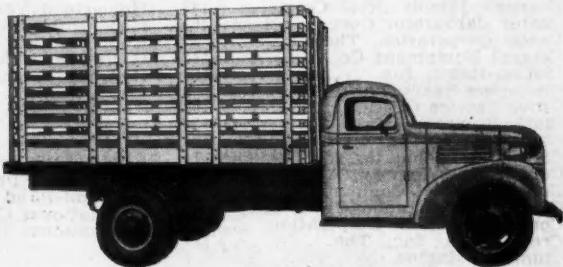
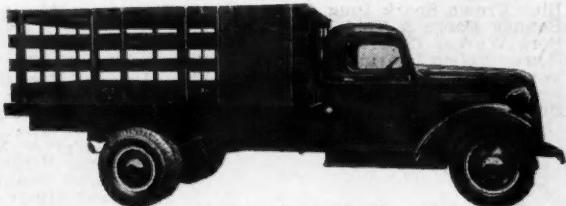
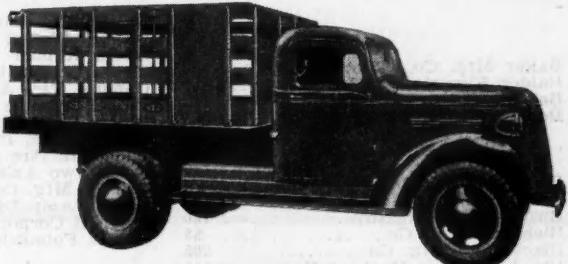
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FOR ALL MAKES OF TRUCKS

These time-tested features have made and will continue to make Perfection Truck Bodies the BEST BUY for Fleet Owners everywhere—Adjustable sills—Solid unyielding understructure of virtually one-piece construction through the generous use of welding—Correctly spaced sill-spacers prevent spreading or overturning—Rounded stake pockets to prevent tearing out of rails—Reinforced stakes—Rear stake section locks. Write for names of Distributors, also Bulletin and prices.



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GALION, OHIO

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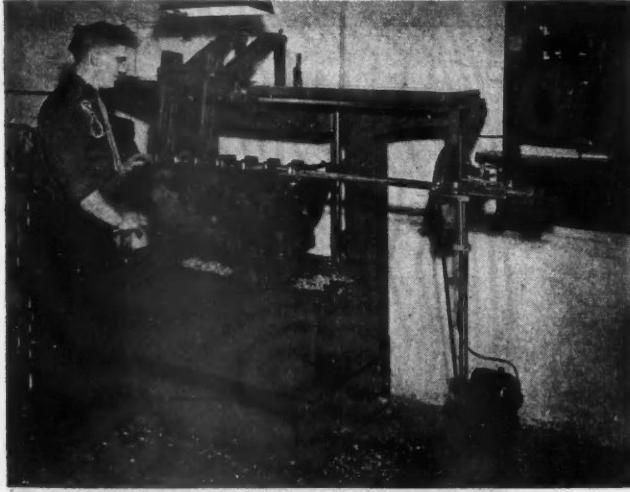
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Size Is No Obstacle For The TOBIN-ARP Line Boring Machine

It handles everything up to cmd including the R. D. 8 Caterpillar. The design and construction of this machine assures perfect alignment and mirror finished bearings in boring main and camshaft bearings. Above is shown Waukesha motor whose seven main bearings are being line bored—a job easily and accurately performed. Write for complete details.

TOBIN-ARP MFG. CO.

2845 Harriet Ave. S.

Minneapolis 8, Minn.



SPEED NUT is started over stud by hand ...

... then pushed down on stud with tool.

Spring Tension Lock

Parts are held together with firm spring tension lock.

This unique spring steel fastener needs only to be pushed over rivets, nails, tubing, wire, integral die cast or plastic studs to lock parts firmly together.

Save threaded inserts, drilling and tapping, reduce mold costs and assembly time, prevent vibration loosening. Avail-

able in many sizes and shapes.

Write now for samples of Push-On type SPEED NUTS, giving stud diameter and any other pertinent assembly details.

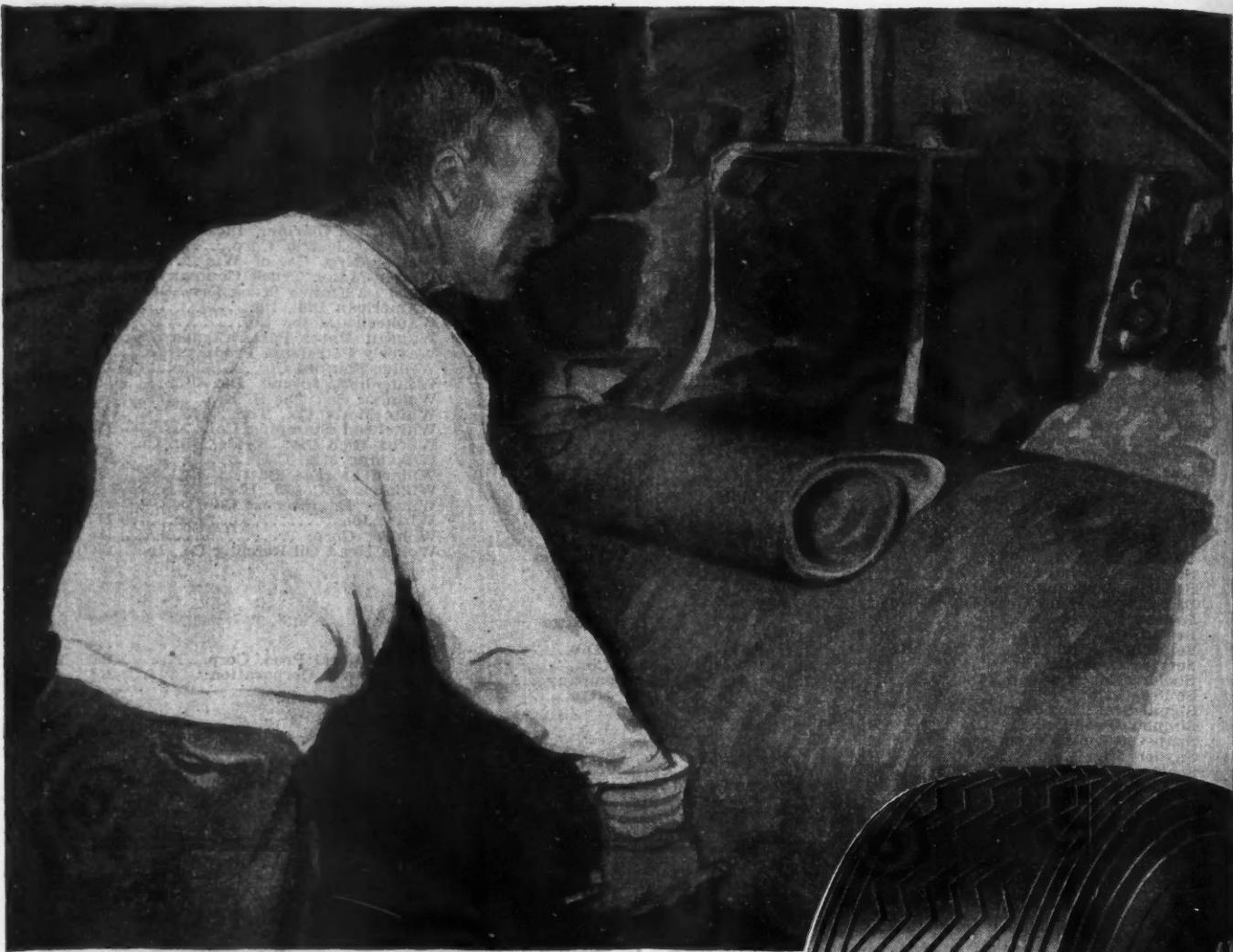


THE BASIC PRINCIPLE
of Spring-Tension Lock is
Embodied in all Speed Nut Designs

TINNERMAN PRODUCTS, INC.

2020 Fulton Road • Cleveland 13, Ohio

Speed Nuts



An Invitation To Better Business After Victory

Prepare to meet the pent-up civilian demand for tires with a quality line that will register profits for you. Plan a sound, permanent business with Armstrong.

Enjoy a real competitive advantage in your post-war market through our straight-line distribution plan direct from our strategically located factories.

This is a good time for us to get better acquainted. Write today for your copy of The Armstrong Plan outlining a profitable post-war future.

THE ARMSTRONG RUBBER CO.

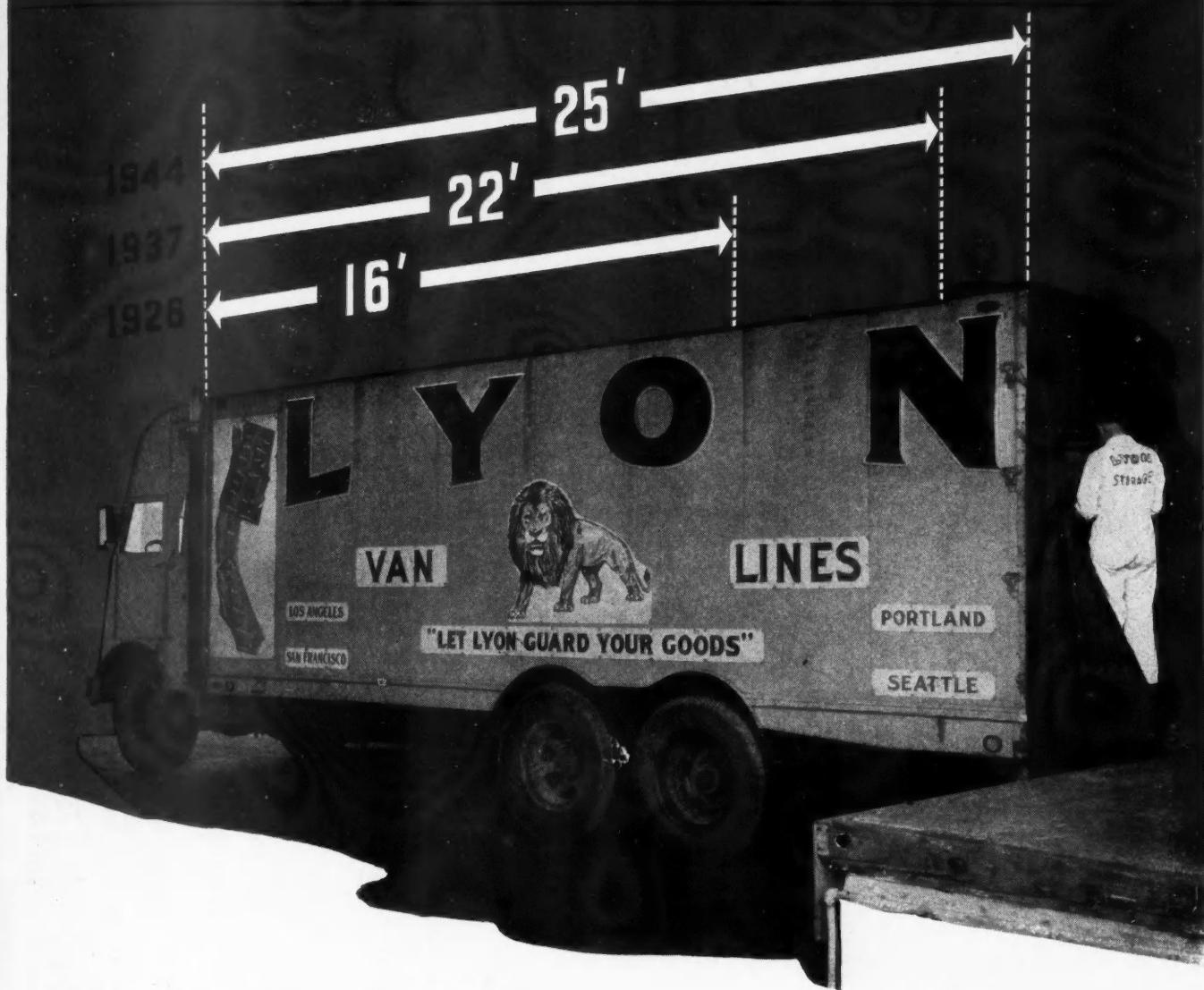
Manufacturers of Quality Tires and Tubes for 32 Years

GENERAL OFFICES AND PLANT—400 ELM ST., WEST HAVEN 16, CONN.

Factories in
West Haven, Conn. Natchez, Miss. Des Moines, Iowa

ARMSTRONG TIRES

Here's a truck that's grown 9 feet in 18 years!



Built of Alcoa Aluminum in 1926, this truck body originally had a 16-foot loading length. It weighed 1,600 pounds less than a similar body made of heavier materials. On the basis of one round trip per week, at a 1926 freight rate of \$4.40 per hundred pounds, the heavier payload increased the truck's earnings \$140.00 per week.

As highway load limits were raised, the carrying capacity of this truck was increased. In 1937, six feet of loading space were added to the aluminum body, and it was remounted on a new traction

unit. In 1944, three more feet were added, and it was again mounted on a new chassis. Today, Lyon Van Lines estimate that this aluminum body is saving them \$3,150 annually.

In these 18 years of constant service, not more than \$50 has been spent on the aluminum body for repairs or maintenance. For information on how you, too, can save weight—and money—with Alcoa Aluminum, write ALUMINUM COMPANY OF AMERICA, 2139 Gulf Bldg., Pittsburgh 19, Penna.

ALCOA FIRST IN
ALUMINUM



Another Great Leader in a Great Line...FWD's Model SU



Famous 5-Tonner Tops

\$ 75,000,000⁰⁰ ENDORSEMENT



When a single model of a heavy duty truck is purchased in volume reaching a total dollar value of \$75,000,000.00 in less than four years time, it rightfully gains leadership in its field. FWD's Model SU has won an extraordinary recognition—the endorsement of motor truck buyers exemplified in \$75,000,000.00 worth of trucks bought and used since 1940.

It is significant, too, that in a comparatively brief period of years this single model FWD has a background of \$75,000,000.00 in manufacturing experience as well. In every sense it is a great leader in a great line of trucks.

The FWD model SU represents the most advanced development of the four-wheel-

drive principle originally pioneered and sponsored by FWD since 1910. It is eminently qualified in every element of design and construction to render service of a character and extent far beyond that of any other truck.

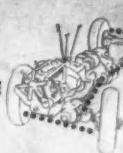
More than ever before essential industries and motor transport organizations rely on Four-Wheel-Drive hauling power to do more work—cover more miles—at lower cost for gas—oil—tires—replacements.

When your need is dependable all-season, all-weather hauling power—look to FWD's—a great line of trucks.

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wisconsin
Canadian Factory: KITCHENER, ONT



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TRUCKS

BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS

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